ECHNOLOGY DEPT.

NOVEMBER, 1952

Telephone and Management Engineer

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DETROIT

THE NATIONAL TELEPHONE MAGAZINE

Featuring In This Issue—

- That Drag Between Petition & Order, *by John C. Doerfer*
- New Construction Methods, *by Richard Allen*
- Modern Central Office Maintenance, *by John S. Reed*
- Washington Bureau Reports • Questions & Answers

THE BATTERY OF *Perpetual Youth!*

Gould Planté—
The Aristocrat of
Stationary Batteries

The one big reason why Gould Planté batteries last practically forever is the use of *pure lead* positive plates! They have no antimonial impurities to contaminate negative plates and shorten battery life. And, a huge reserve of pure lead continually replenishes the spent active material in the positive plates to give them the lowest per annum cost of any battery on the market! For utmost dependability and economy, there's *nothing* like Planté—the Aristocrat of Stationary Batteries.

You may be able to save up to 50% on maintenance costs throughout the life of your stationary batteries through the use of the Gould Plus-Performance Plan. Write Gould Battery Information Headquarters for full details.

GOULD *Industrial Batteries*

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

In any **MODERN** switchboard installation–

Photo courtesy of Stromberg-Carlson

the choice is **ACCURATE AUTOMATIC TOLL TIME CALCULATING AND RECORDING**

by **CALCULAGRAPH**

Because they quickly save many times their initial cost, CALCULAGRAPH permanent printed records eliminate switchboard detail work, speed service. Accuracy-to-the-second permits collection of all the revenue due on every call. CALCULAGRAPHS are precision instruments featuring high visibility dials, smooth silent lever action. Available in several models, they can be engineered into new equipment by your switchboard builder or easily included in your present set-up. For complete information just call or write.

CALCULAGRAPH COMPANY

HARRISON • NEW JERSEY

THE STANDARD OF ACCURACY SINCE 1892

Across The Editor's Desk

Tennessee makes our front cover again. We were not in attendance at their recent convention as a conflict in convention dates took us to the Michigan meeting at that time. Our congratulations to the Tennessee association for the increased interest and attendance they have inspired during the past few years.

• • •

P. M. FERGUSON, manager of the Mankato (Minn.) Citizens Telephone Co., was the subject of a "Personality Profile" in an October issue of the Mankato News. Pete started with the company in 1907 and became manager in 1908. The newspaper named Mr. Ferguson as an outstanding citizen for his work on civic affairs and stated he was the founder of many of the organizations that have helped to build Mankato. We testify ourselves to his fishing prowess and his ability as a raconteur of stories of his countrymen from Scotland.

• • •

Our recent visit to Georgia and South Carolina was indeed one to remember. We wish to again thank MILTON STEWART, RICHARD LINNEMAN, of Gladwin Plastics, and the FRANK BARNES, Sr. and Jr. for their wonderful hospitality. We visited Clemson College, the alma mater of the Barnes, for the first time. We also wish to thank GORDON SAUNDERS for his aid in furnishing recreational facilities during a layover at the beautiful Hotel Clemson. These Georgians and South Carolinians produce a wonderful brand of comraderie and hospitality.

• • •

MERLE HALE, executive vice president of the Lincoln (Nebr.) Tel. & Tel. Co. and retiring president of the Independent Telephone Pioneer Association, was honored by that group on his retirement from office with the presentation of a plaque outlining his service to the Independent Pioneers. The presentation was made at the organizational meeting of the new board of directors. Merle left a record enrollment in the organization.

The National Telephone Magazine

Telephone Engineer and Management

NOVEMBER 1952 VOL. 56 NUMBER 11

Editor, RAY W. SMITH • *Advertising Director,* ROY F. SMITH
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FRONT COVER

Officers of Tennessee Telephone Association (l. to r.): John J. Moran, first vice pres.; Homer J. Wright, pres.; C. W. Chastain, sec.-treas.

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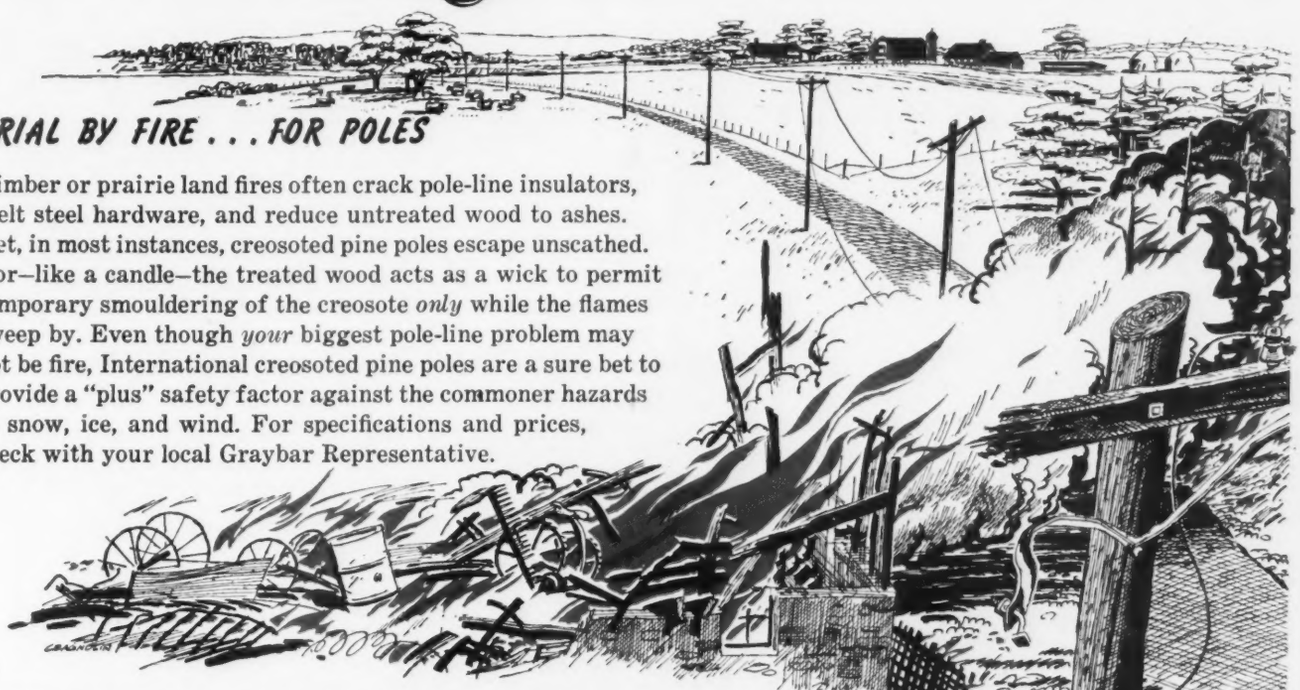
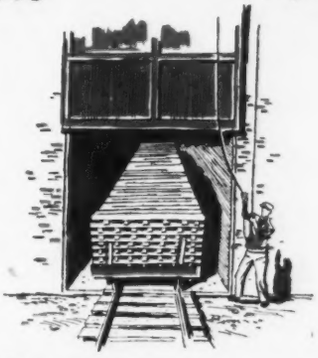
GraybaR TELEPHONE NEWS

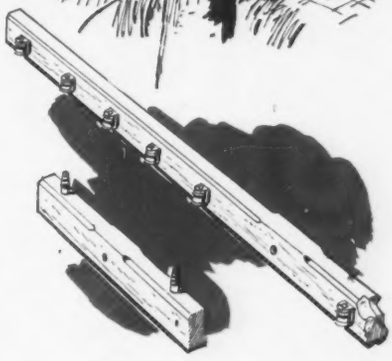


TRIAL BY FIRE . . . FOR POLES

Timber or prairie land fires often crack pole-line insulators, melt steel hardware, and reduce untreated wood to ashes. Yet, in most instances, creosoted pine poles escape unscathed. For—like a candle—the treated wood acts as a wick to permit temporary smouldering of the creosote *only* while the flames sweep by. Even though *your* biggest pole-line problem may not be fire, International creosoted pine poles are a sure bet to provide a "plus" safety factor against the commoner hazards of snow, ice, and wind. For specifications and prices, check with your local Graybar Representative.

WRINGING OUT WATER STERILIZES WOOD





Wood-destroying fungi are responsible for crossarm decay – *not* natural aging. That's why all Rainier crossarms are carefully seasoned in giant dry kilns like these. Over 5½ pints of water are removed from an average 3½" x 4½" x 8' Rainier crossarm. High kiln temperatures kill all wood fungi, while reduction of wood moisture content to 12% prevents new growth.

Many Graybar customers consistently get "above average" service life from Rainier arms.

Samuel F. Morse placed the first order for poles in March 1844. 8" at the butt and 24' in length, these sturdy chestnut poles were used for the B & O's original telegraph installation. The delivered cost – 98¢ each.

Though prices are higher today, Graybar-distributed National cedar and fir poles weigh only half as much as the once-standard chestnut. Whether you specify full length or butt-treated poles you're sure to save money in handling and installation costs.

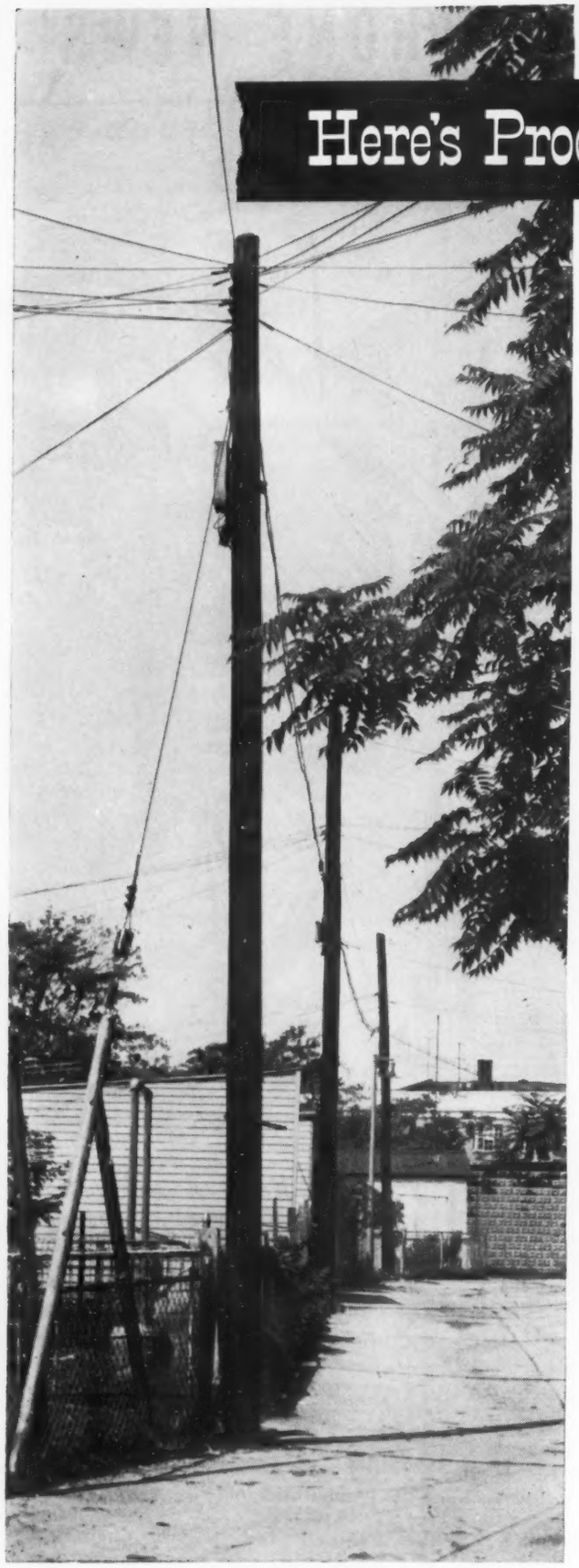
NEED A 2-PIN OR DEAD-END CROSSARM?

If not, chances are we'll have it when you need it. That's one of the nice things about doing business with Graybar. Remember, too, that on a single order you can obtain hardware, pins, and miscellaneous items—everything you need for pole-line extension and maintenance, as well as central station equipment. 202-2211

Call Graybar first for...

IN OVER 100 PRINCIPAL CITIES

GRAYBAR ELECTRIC CO., INC.
Executive Offices:
Graybar Building, New York 17, N. Y.



Here's Proof of Performance...

Over 99% of the poles installed by the Chesapeake & Potomac Telephone Co. in Washington, D. C. are Pressure-Creosoted

IN 1930 the Chesapeake & Potomac Telephone Company turned to pressure-creosoted poles to secure longest possible life for their 67 square mile network of telephone poles in the Washington, D. C., area. The three poles shown here, located in an alleyway between 16th and 17th Sts., S. E., have been in service since that time and are good for many additional years' service.

Pressure-creosoted poles are inspected every six years until they have been in service 17 years and every three years thereafter. On the basis of these inspection tests, the Company feels it should realize at least 30 to 35 years of service out of each pole.

When you choose a wood preservative, let records like these be your guide.

Creosote Oil contains not one but many compounds whose toxicity and permanence ward off attack by such wood destroyers as termites, fungi, dry rot and marine borers.

When you use treated wood, be sure it is pressure-creosoted with U·S·S Creosote Oil—a product of the world's largest tar distillation plant. For complete information, contact our nearest Coal Chemical sales office or write directly to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

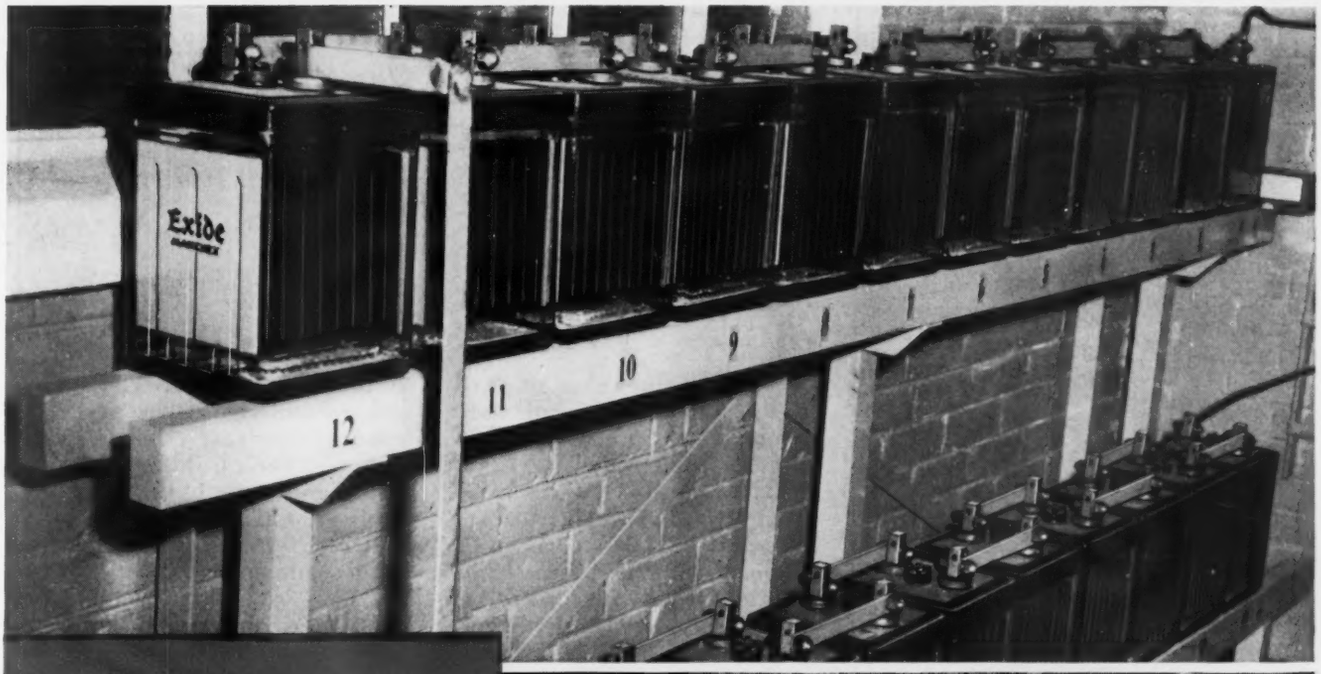
U·S·S CREOSOTE OIL

USS

2-1687

UNITED STATES STEEL

Exide-Manchex 23-cell DME-17 provides battery power for the company's 180-line PABX System.



Large PABX System powered by dependable

Jones & Lamson Machine Company, Springfield, Vt. 300,000 sq. ft. of manufacturing floor space.

Exide-Manchex BATTERIES

It's in the big and busy plant of Jones & Lamson Machine Company, Springfield, Vermont. With its many trunk lines and 180 inter-plant lines, this industrial automatic system has a capacity equal to that of the central office of a small independent telephone exchange. Battery power is provided by the Exide-Manchex . . . assuring:

POSITIVE OPERATION: Dependable performance for all telephone battery requirements—central office and private branch exchange equipment.

ADEQUATE RESERVE POWER for emergencies beyond normal needs.

LOW OPERATING COST: Extremely low internal resistance.

LOW MAINTENANCE COSTS: Water required about twice a year. No change of chemical solution during life of battery.

LOW DEPRECIATION: Sturdy, long-life construction, which includes the exclusive manchester positive plate.

GREATER CAPACITY in a given amount of space avoids over-crowding of equipment.

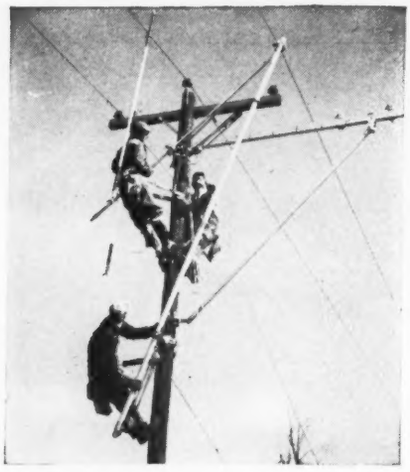
• • •

Various sizes and types of Exide Batteries, up to 100 ampere hours capacity, are available in plastic containers.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto
"EXIDE" and "MANCHEX" *Reg. T.M. U.S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 64 YEARS . . . 1952

SAFE ON THE JOB

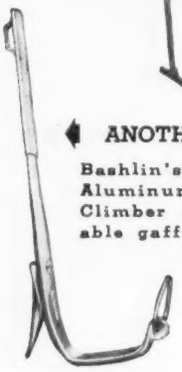


BASHLIN EQUIPPED!

Using

HOT LINE TOOL FACTORY DEMONSTRATORS

Men who think first of safety and efficiency on the job — use Bashlin Equipment.



ANOTHER FIRST

Bashlin's ALCOA alloy Aluminun Adjustable Climber with Removable gaff.

Self-locking screws assemble precision machined parts.

Write Today for Catalog No. 50

W.M. BASHLIN
COMPANY
GROVE CITY 1, PA.

"QUOTES"

"Today the value of the dollar bill is one-half of what it was in 1932—52 cents compared with $1.03 in 1932, and $1.00 in 1940. While the dollar shrunk by one-half in 20 years, the Federal tax burden on the average family increased by 25 times. In 1932, the average share of the two billion dollars collected in total Federal taxes was $64. During this fiscal year, 1953, a family's Federal taxes, income plus hidden taxes, will average $1,700." — *Red Springs (N.C.) Citizen.*

• • •

"We believe there is downright concern at this moment over governmental trends. Underneath the natural interest everybody had in the coming election, one often detected a vein of anxiety, a desire to do something, a determination to make a change. One special point of concern was the pattern of thinking apparent in our government. It is the same pattern seen in other countries where freedom and private enterprise have lost their holds. Always this trend starts in the name of national defense." — *Washington (Iowa) Evening Journal.*

• • •

"Americans have become accustomed to thinking of the money they earn in terms of take-home-pay. They have forgotten that not too long ago the wage earner spoke of his pay without thinking about 'pay after taxes.' The Federal government today takes its cut first. You get what is left." — *Northport, Long Island, N.Y. Observer.*

• • •

"Only twelve years ago our Federal tax bill was slightly over 5 billion dollars. . . .By 1945 it had risen to almost 45 billion and in 1952 it is more than 62 billion dollars. And this, mind you, is not the total spending. . . .On top of that comes the inflationary borrowing and debt. . . . That is the awful price we pay for the dubious benefits of the welfare state." — *Neligh (Neb.) Leader.*

• • •

"We wonder . . . .how those who are concerned with social justice in wage matters can condone the actions of economic bureaucrats who would raise the potential earnings of one segment of the population while the millions who are not covered by automatic living cost increase clauses have to dig deeper and deeper into their purses and their reserves."— *Boyne City (Mich.) Citizen.*

My Neighbors

By BILL PAULSON

"I paid 167 *hidden* and *direct taxes* to get here...so GOL-DURN IT, *BITE!!*"

Distinctive!
AUTOMATIC'S NEW CORDLESS PBX
The grey-green sloping front of this switchboard, the simple lines of the cabinet—even such little details as the "finger-fitting" key handles—all make this the *right* PBX for the modern office . . .
For any subscriber needing up to 20 telephones, and desiring a "full-time" attendant, you'll render a real service by installing Automatic's new Cordless PBX Switchboard!
AUTOMATIC ELECTRIC

CAPACITIES Two sizes—10 lines, 4 trunks, 5 connecting circuits; and 20 lines, 5 trunks, 5 connecting circuits. Can be supplied for 24- or 48-volt operation, and for use on automatic, manual, or magneto central-office trunks. A standard desk-type telephone is used as the attendant's instrument.

OPERATION

"Cordless" operation completes any desired connection (trunk-to-line, line-to-trunk, or line-to-line) by simple key operation. Each trunk terminates on a vertical group of three keys (red), with a green "calling" lamp above. Each line terminates on a similar group of three keys (green), with a white "calling" lamp above. The attendant's telephone terminates on another group of keys (white). Operation of the proper keys quickly interconnects line, trunk and attendant's telephone as desired. Supervisory lamp (red) shows when call is completed. Panel equipment is escutcheon-mounted for easy maintenance; cabinet may be removed by loosening three screws.

Operation and ringing current may be supplied from the central office, or locally. On trunk calls, transmission current is provided from the central office, thus permitting "through" supervision. Turn keys for battery cut-off and night alarm are located at the right-hand end of the panel, together with a generator key, which permits use of the hand generator in case of failure of ringing current.

TRUNK HOLDING—Provision is made for holding incoming trunk calls.

NIGHT SERVICE—During the night, or when the switchboard is left unattended, each of the central-office trunks may be connected straight through to a PBX station, to receive or originate calls on that trunk.

THE NEW CABINET of the Cordless PBX is constructed of red birch, especially finished to complement the furnishings of the modern office. When requested, the cabinet can be made of mahogany, oak or walnut with a choice of finishes.

Where line resistances (including substation equipment) do not exceed 200 ohms, lamp signals in series with the lines are used. For lines of greater resistance (up to 500 ohms) line relays are furnished. Operating limits are 400 ohms for exchange trunks, and 700 ohms for any combination of line and trunk.

When Ordering or Requesting Quotations—

State as much of the following information as applies to the particular situation.

1. **Specify line capacity of cabinet.**
2. **Specify number of lines to be equipped with line relays and without line relays.**
3. **State whether central office switchboard is automatic or manual, 24- or 48-volts, or magneto.**
4. **Specify number of trunks to be equipped.**
5. **If switchboard is to be trunk connected to magneto central office switchboard or is to be arranged to operate on 48-volts . . . give necessary details of central office equipment.**

10 LINE

Dimensions	22⅝" wide x 13" high x 13⅝" deep
Net Weight	85 lbs. (Approximate)
Shipping Weight	125 lbs. (Approximate)

20 LINE

Dimensions	32¼" wide x 13" high x 13⅝" deep (Approximate)
Net Weight	110 lbs. (Approximate)
Shipping Weight	150 lbs. (Approximate)

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

Circular 1793

Printed in United States of America—23M—10-52—S. H. Co.

NEWSLETTER
TELEPHONE ENGINEER

Fortnightly TELEPHONE ENGINEER ★ TELEPHONE ENGINEER AND *Management*

ON THE 1st OF EACH MONTH ON THE 15th OF EACH MONTH

NEWSLETTERS *on Alternate Weeks*

November 15, 1952

Dear Sir:

In response to petitions from both television & private radio-communications interests, FCC extended until Dec. 22 deadline for filing comments on commission's proposal governing assignment of 72-76 mega-cycle frequencies to operational fixed stations & fixed stations in domestic fixed public service.

Action had been expected after several petitioners had asked for more time to consider effects of proposal on television interference & on long range planning by private radiocommunications organizations. Previous target date for filing recommendations was Oct. 20.

In addition to comments filed by Radio-Television Manufacturers Association, National Association of Radio & Television Broadcasters, National Broadcasting Co., Motorola Vice President Dan E. Noble, American Petroleum Institute's Central Committee on Radio Facilities, National Forest Industries Communications & individual agencies from both television & industrial fields, further recommendations have been received by commission from US Independent Telephone Association, National Committee for Utilities Radio, & Menomonie (Wisc.) Chamber of Commerce.

USITA said that rule proposal is of "some assistance to the Independent branch of the telephone industry due to the possibility that Independent telephone companies, on the proposed basis, might derive some benefit from the use of frequencies in this band for domestic point-to-point public service." However, telephone association pointed out, "the subordination of the requirements of Independent telephone companies to those of other services for frequencies in this band does not appear to be in the interest of the general public served by these telephone companies."

* * *

Four technical papers, one by representative of each of three armed services, & one by spokesman for Communications Panel of Research & Development Board, will be presented at meeting of the Institute of Radio Engineers Professional Group on Communications Systems at Coles Signal Laboratory, Fort Monmouth, N. J., Nov. 21.

Topics of technical papers include: introduction to new tactical military radio communications systems; Air Force Globecomm systems planning; aspects of Naval communications systems; & manufacturers' contribution to military communications. Attendance at meeting, which includes guided tour of laboratory, is limited to 70. IRE Vehicular Communications Group has been invited to join in meeting.

Average pay increases of 16.9 cents hourly for new unit of employees of General Tel. Co. of Southwest, represented by Communications Workers of America, were approved by Wage Stabilization Board. Also endorsed by WSB was introduction of vacation, holiday, severance pay, sickness & welfare benefit plans.

* * *

In only other WSB telephone action, Boone County (Ark.), Tel. Co. was given approval to boost pay of 35 employees by 8.21 cents hourly average & increase six other workers' pay by average of 19.17 cents an hour. No union is involved.

* * *

Communications industry had 27,000 more employees in Sept. than for same month last year, but recorded decline of 13,000 between Sept. & Aug. of this year, Bureau of Labor Statistics reported in its monthy estimate of employment in nonagricultural establishments, released Oct. 21.

For Sept., 1952, BLS recorded total of 723,000 employees in communications field, compared with 736,000 in August, 729,000 in July, & 720,000 in June of this year. Employment in communications in September, 1951, totaled 696,000.

* * *

Denied without hearing its application for Nebraska rate increase to offset added wage & other costs, Northwestern Bell Tel. Co. took case to state Supreme Court.

Northwestern Bell, in its Nebraska appeal, asked state's highest court to set aside commission's decision & require it to consider company's rate application. Company also asked commission for approval of temporary rates, to be collected under bond, pending decision on the appeal.

Southern Bell Tel. & Tel. Co., rejected in its request for Alabama rate boost to defray higher operating expenses, is studying subject to decide what its future course of action will be.

In connection with Alabama commission's rejection of Southern Bell's rate application, company's Alabama Manager, Harry B. Lackey, declared that commission action denying recovery of increased wage cost "is most disappointing and concerns us greatly." He added that rates established last February did not include any amount to cover wage increase.

Citing its sharply-rising costs, Chesapeake & Potomac Tel. Co. of West Virginia asked state Public Service Commission to authorize $550,000 in additional annual gross revenue on interim basis, as part of overall application for gross increase of $1,950,000 a year, or $900,000 after taxes.

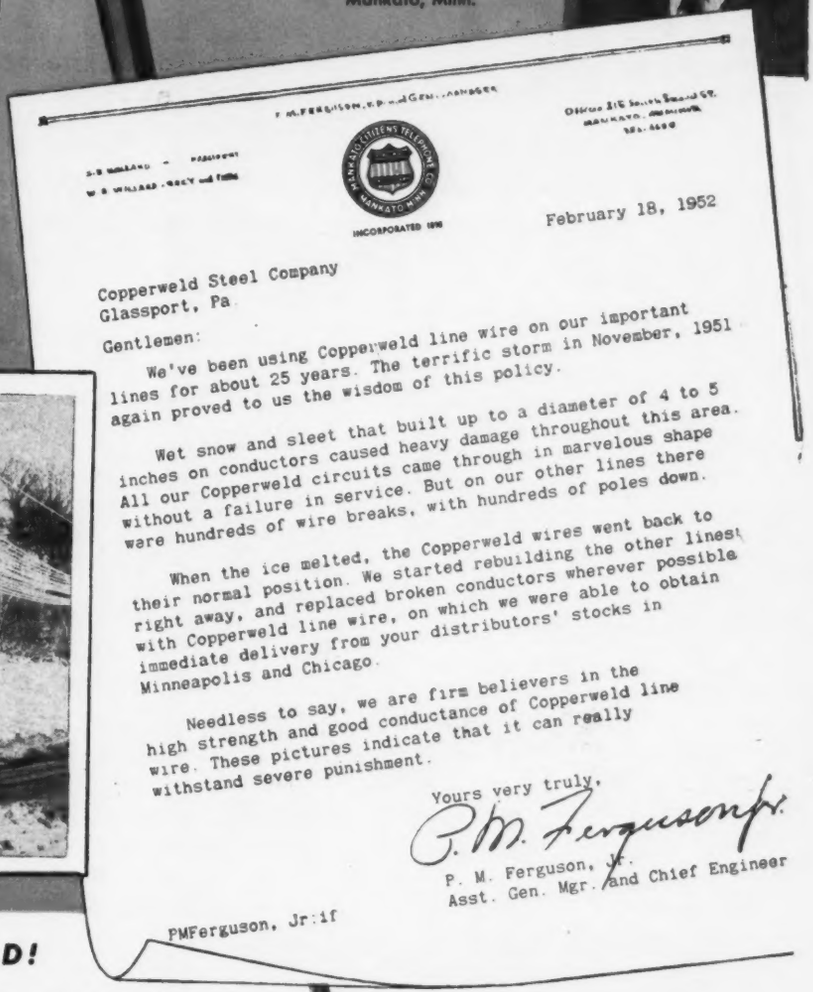
Ray Smith

Ray W. Smith, Editor

4" of SNOW and SLEET on our Copperweld TRADE MARK LINES WITHOUT A FAILURE IN SERVICE

reports P. M. FERGUSON, JR.

Mankato Citizens Telephone Co.
Mankato, Minn.



February 18, 1952

Copperweld Steel Company
Glassport, Pa.

Gentlemen:

We've been using Copperweld line wire on our important lines for about 25 years. The terrific storm in November, 1951 again proved to us the wisdom of this policy.

Wet snow and sleet that built up to a diameter of 4 to 5 inches on conductors caused heavy damage throughout this area. All our Copperweld circuits came through in marvelous shape without a failure in service. But on our other lines there were hundreds of wire breaks, with hundreds of poles down.

When the ice melted, the Copperweld wires went back to their normal position. We started rebuilding the other lines right away, and replaced broken conductors wherever possible with Copperweld line wire, on which we were able to obtain immediate delivery from your distributors' stocks in Minneapolis and Chicago.

Needless to say, we are firm believers in the high strength and good conductance of Copperweld line wire. These pictures indicate that it can really withstand severe punishment.

Yours very truly,

P. M. Ferguson, Jr.
Asst. Gen. Mgr. and Chief Engineer

PMFerguson, Jr:if

IT PAYS TO STRING COPPERWELD!

When building new lines or modernizing old ones, it will pay you to keep in mind the experience of this well-known telephone man. Thousands of operators and builders of overhead lines agree with him that Copperweld* Line Wire can take terrific punishment without service interruptions.

Remember, non-rusting Copperweld Line Wire has greater strength than any wire of comparable electrical properties—and has better transmission characteristics for voice and high frequency circuits than all other types of high-strength conductors.

Because of its permanent strength, Copperweld assures safer long spans . . . is the most economical line wire for dependable, long-lasting construction. Write us today for complete technical data.

*Trade Mark

COPPERWELD STEEL COMPANY, Glassport, Pa.

SALES OFFICES IN PRINCIPAL CITIES

Copperweld TRADE MARK Line Wire

SOLD BY LEADING DISTRIBUTORS

Here They Are . . .

in BLACK and WHITE..

A FEW OF THE IMPORTANT ADVANTAGES OF KELLOGG CROSSBAR

Minimum Maintenance Costs

All connections established through precious metal contacts by relay type action only. No mechanical routing necessary. Maintenance involves no more effort or cost than line relay equipment.

Drawer Mounted Crossbar Switches Individually Covered

Switches can be pulled out the same as file cabinet drawers for inspection. And this simple, easy operation does not mean that switches must be taken out of service.

Lower Installation Costs for Additions

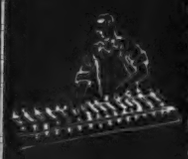
All units are factory tested and completely wired to plug-in terminals. No wiring or soldering is required to add Crossbar units.

No Multiple Wiring

The contact multiples are a built-in feature of the superior Kellogg Crossbar switch.

Full Station Intercept

Equipment to intercept a call to any station and extend it to a control board is provided.

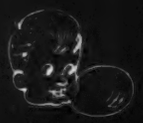


Crossbar Equipment Is Factory Wired

Frames wired for their ultimate capacity, regardless of initial equipment. All Crossbar switches and relay units are factory wired and ready for installation, merely by plugging in.

PBX Service

Connector frames are pre-wired for PBX service. This service can be furnished or added to any 100 line group without equipment or wiring changes.



Maximum Expansion

Kellogg Crossbar switching equipment can be expanded almost without limits—easily, quickly, economically.

For Now and the Future— It Grows!

From ten to ten thousand lines, Kellogg Crossbar will grow and grow, in pace with your own growth and future requirements.

Instantaneous Seizure of Paths

Instantaneous inter-office dialing between all required points. Switches operate in one movement in no more time or travel than it takes for the average relay to operate. This speed accomodates the high standards of nation-wide inter-toll dialing without altering the equipment.

High Traffic Capacity

Crossbar can handle more calls per unit of equipment than any other switching system. Each switch has multiple paths. From 10 to 20 simultaneous calls can be placed through Crossbar switches.

Extra Long Life

Minimum movement means minimum wear! Switches are constructed of simple, tough, long-wearing parts. Each relay spring has twin precious metal contacts and is designed for minimum wear and maintenance.

KELLOGG ... An IT&T Associate

AN ASSOCIATE OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

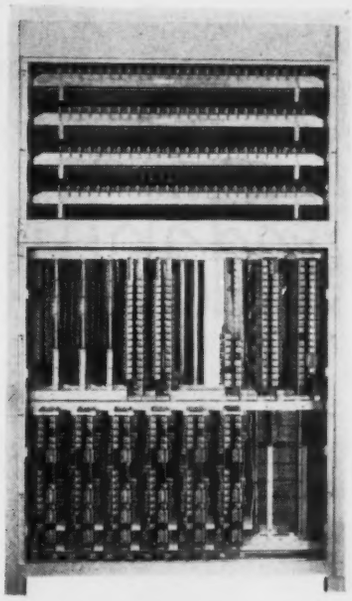
Sales Offices: 79 W. Monroe St., Chicago 3, Ill.
Factory: 6650 S. Cicero Ave., Chicago 38, Ill.

E... the Salient Facts of

KELLOGG's

Achievement of the Century--

Crossbar



Built for TODAY *and* TOMORROW—*Crossbar* by KELLOGG is the logical answer to Independent Telephony's present requirements and future needs for inter-toll dialing, better service and greater profits! *Crossbar* has been proved and improved—in the laboratory, in manufacture and by on-the-firing-line tests! In actual exchange operation, in a wide variety of installations, *Crossbar's superiority has been proved by use!*

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Kellogg Switchboard and Supply Company,
79 W. Monroe St., Chicago 3, Ill.

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FIRM_____ POSITION_____

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SUPPLIES OF Proven Dependability

• Shipment of guaranteed line supplies made from distribution center nearest you . . . Kellogg's warehouses located in Chicago, Kansas City, Dallas, San Francisco and St. Paul.

The following nationally-known manufacturers of supplies for the independent telephone field are participating in the 1952 Kellogg Co-Operative Campaign.

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Ansonia Electrical Company

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A Division of Union Carbide and Carbon Corporation

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Simple, Quick and Sure! For splicing two wires of different sizes, there's nothing simpler than using Nicopress Reducing Sleeves and Nicopress 17-2 Tool. Splices are always tight and strong. Tool and sleeves are made by the NATIONAL TELEPHONE SUPPLY CO.

For All Telephone Soldering—Original dual-heat Weller Soldering Guns handle all jobs. Instant heat saves time, power. Prefocused spotlights and longer reach—no wedges or flashlights. Tough, dielectric plastic housing. Made by WELLER ELECTRIC CORPORATION.

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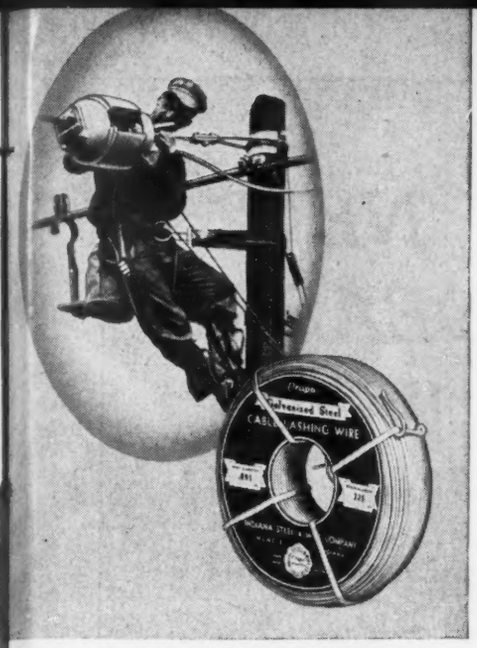
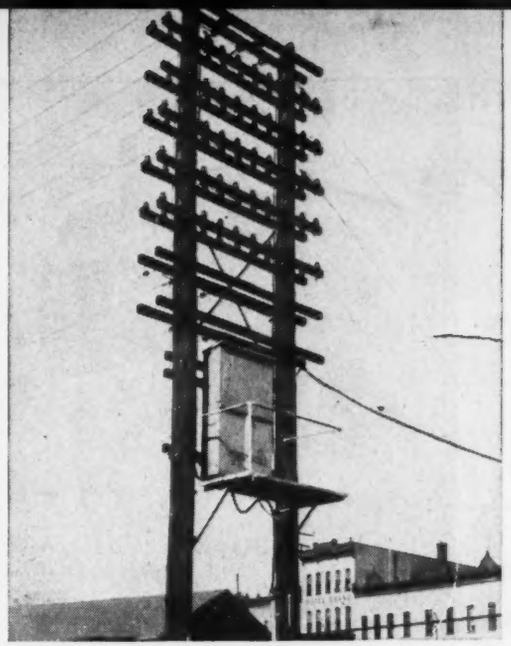


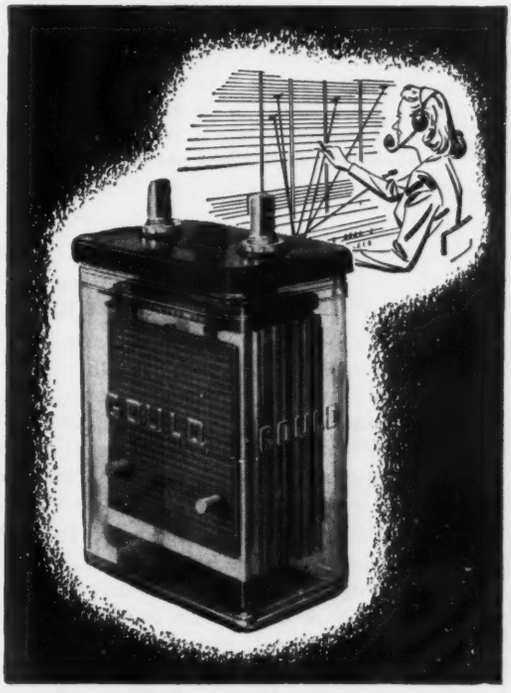
Available Now for use with modern cable spinners, is Crapo Galvanized Steel Lashing Wire. Heavily-galvanized; .091" diameter, comes in 335-ft. coils. "Stainless Steel" Lashing Wire is also available in .045" and 0.65" diameters. Both products of INDIANA STEEL & WIRE CO.



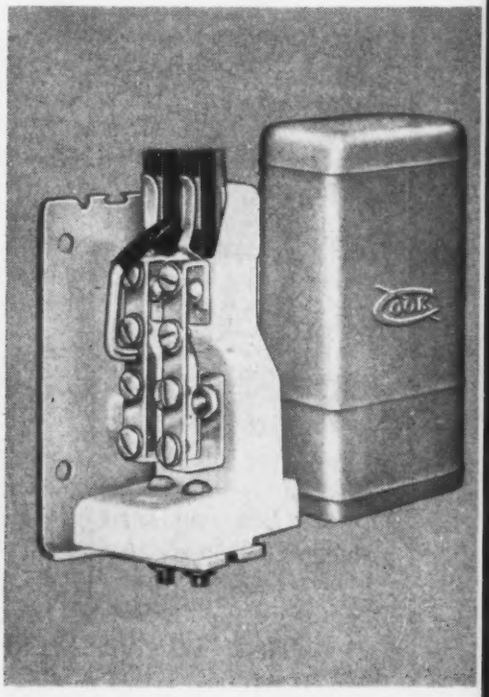
Economy in Overhead Construction is assured when crossarms manufactured by the CONTINENTAL CROSS-ARM COMPANY, INC., are a part of your wire and pole installation. Crossarms are made of fully seasoned American wood —built to sound standards of dependability.

Fits Telephone Needs to a "T"—The Ray-O-Vac 6 telephone cells are ideally suited for telephone work because the RAY-O-VAC COMPANY has perfected a specially compounded mix which permits these cells to give lower cost per hour of service. Economical and dependable.

"Hostilities will cease on the whole front on Nov. 11 at 11 A.M." Thus went the telegram ending World War I. In peace and war, research has enabled Hemingway Insulators, made by AMERICAN STRUCTURAL PRODUCTS COMPANY to provide increasing efficiency.



Outstanding Battery Performance is yours when you choose Gould Planté Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., a leader in their field. They're the finest money can buy.



Save Drop Wire with the new Cook Party Line Junction. Ideal for terminating and protecting the cable pair drop, the cable pair, and distributing four party line drops. Porcelain base, steel mounting bracket and zinc non-corrosive cover. Made by COOK ELECTRIC COMPANY.

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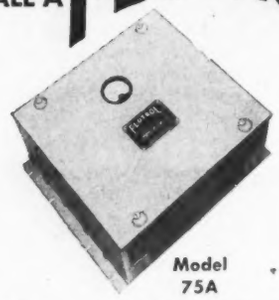
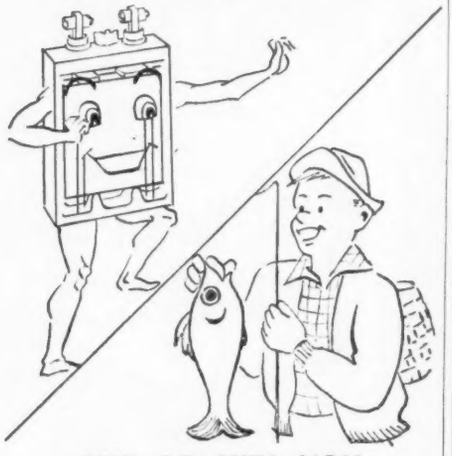
TAKE A LOAD OFF
YOUR BATTERIES

AND OFF YOUR MIND
INSTALL A FLOTROL



Model 75A

THEY'LL ENJOY THE REST



AND SO WILL YOU

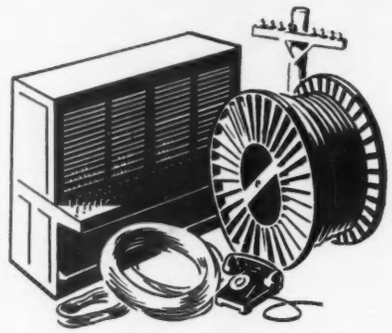
FLOTROL has no moving parts, requires no routine maintenance or adjustment; it supplies the load current as you need it, doesn't wait for the load to pull the battery down and then recharge the battery. Result—longer battery life, less power consumption, fully charged batteries all the time, and scores of maintenance man-hours saved yearly.

Single-phase models from 1/2 ampere to 24 amperes, described in Bulletin 160.

Three-phase models from 25 amperes to 200 amperes, described in Bulletin 161.

LORAIN PRODUCTS CORPORATION
6122 F STREET LORAIN, OHIO

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE



NEW IDEAS AT WORK

SWITCHBOARDS SKID ALONG ON GREASE . . . They greased the skids—and the floor—recently in the Naperville, Ill., telephone exchange.

And without interruption of telephone service, nine switchboards were slid into a new position 15 feet away.

Unusual in the annals of telephone engineering, the switchboard move was necessary to make room for the installation of 12 switchboards which eventually will replace the present ones.

Operators continued to take calls as telephone and Western Electric Company employees slid the three tons of switchboards to the south end of the telephone building.

The switchboard sections were bolted together, lifted on to two 26-foot, braced planks, previously greased for the occasion, and pulled by a chain hoist. The chain was anchored to an "I" beam placed across a window at the rear of the building.

Ten Western Electric Company technicians and three Illinois Bell maintenance men pushed and pulled the switchboards to their new location.

• • •

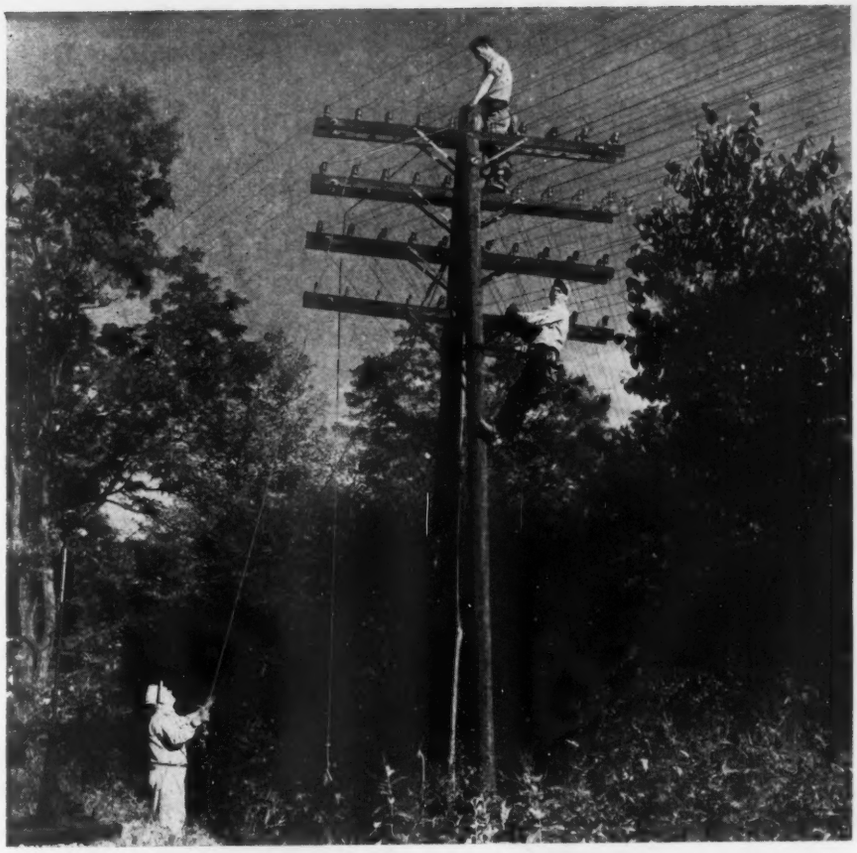
IF THERE'S A BETTER WAY. . . . "Plant construction" to most of us is just another way of saying "hard work," and not many plant men will argue the point.

That is one of the reasons why plant construction people are always looking for the easier way, the more economical way and the better way of doing their part in providing telephone service. According to *Pacific Telephone Magazine* you don't have to go further than the nearly completed 38-mile Sacramento-Stockton N carrier buried cable toll job for illustrations of some new methods and equipment.

Harry C. Hemenway, Inland division plant construction superintendent, and Cliff O. Ekstrom, Sacramento district plant construction superintendent, teamed in developing three new ways of burying toll cable. These include a cable reel brake that pays off the cable in straight lengths; a half-tube on the trenching machine that feeds spliced cable into the trench; and a compacter that back-fills and tamps down the dirt in the trench. All three were used successfully on the Sacramento-Stockton cable project, which is scheduled for completion around December 1.

Usually on such a job, the cable is paid off the reel into the trench, or else laid on the ground and then moved by hand into the ditch. In either case, deep holes were dug in the ground, where the splicers worked in dust or mud. Finally, a gang followed with hand or pneumatic tools to tamp the fill.

On the Sacramento-Stockton job, incidentally, the first buried N carrier cable on the Pacific Coast, most splicing is an above ground task. The trencher picks up and feeds the cable into the ditch via the Hemenway-Ekstrom-designed trough. The motor road grader to which the compacter is attached takes care of both backfilling and tamping.



Construction crew of Southern Continental Telephone Co., Cookeville, Tenn., at work adding outside plant in connection with expansion and improvement of service to the town of Algood, Tenn. Shown in the photo are: On the ground, John Holms, construction foreman; on top of pole, Jack Skimmyhorn, lineman; at lowest crossarm of pole, Frank Miller, lineman.

Industry News Briefs

REA Moving Ahead At Same Pace On Phone Loans

STILL MOVING ahead with telephone loan allocations at a rate of about 2,000,000 weekly, the Rural Electrification Administration, with slightly more than $10,000,000 available in regular funds and another $10,000,000 contingency fund, expects to exhaust the available money in about 10 weeks, or immediately following the first of the year.

The agency has fallen below the $2,000,000 weekly figure at times recently, but the average is still holding good.

Meanwhile, the first cutover of a complete new system by a rural telephone co-op, the Eastern New Mexico Rural Telephone Cooperative, Clovis, New Mexico, was slated for Nov. 8. The co-op received its original allocation in June, 1950, and the entire system involves new construction. A number of other cutovers are scheduled for the remainder of this year and in the first part of 1953.

Through Oct. 23, REA had announced a total of $1,262,000 in farm telephone allocations for the week, with two of the six grants consisting of supplemental loan authority.

New loan allocations went to: Foothills Rural Telephone Cooperative Corp., Paintsville, Ky., $398,000, acquiring the Magoffin Telephone Co., now serving 400 subscribers, with plans to add 556 customers, build 140 miles of line, and operate three dial offices; Green Hills Telephone Corp., Breckenridge, Mo., a newly-organized co-op, $253,000, acquiring three small Independents with 395 subscribers, including 209 switchers, with plans to build 155 miles of new line, install four dial exchanges, and add 120 subscribers.

Rutherford (Tenn.) Home Telephone Co., $175,000, now serving 418 subscribers, to convert to dial, add 240 customers, and build 64 miles of new line; and the Bowman (S. C.) Telephone Co., $120,000, now serving 96 subscribers, to add 269 customers, convert to dial, and build 84 miles of new line.

Supplemental allocations were approved for the Pineland Telephone Cooperative, Swainsboro, Ga., for $110,000, to add to the initial $625,000 approved in February, 1952, because of cost rises; and the East Ascension Telephone Co., Gonzales, La., for $253,000 in addition to an allocation of $259,000 in November, 1950, also stemming from the increase in construction costs.

Incidentally, the REA farm telephone program will make its television debut over Washington station WTOP-TV at 9 a. m. Saturday, Nov. 15. Among those appearing will be REA Administrator Claude R. Wickard and Joseph E. O'Brien, Chief of the Technical Standards Division. The program will include portions of a short motion picture made by REA for training purposes. It will be kinescoped for further showing.

Transistor Goes To Work In Nation's Telephone System

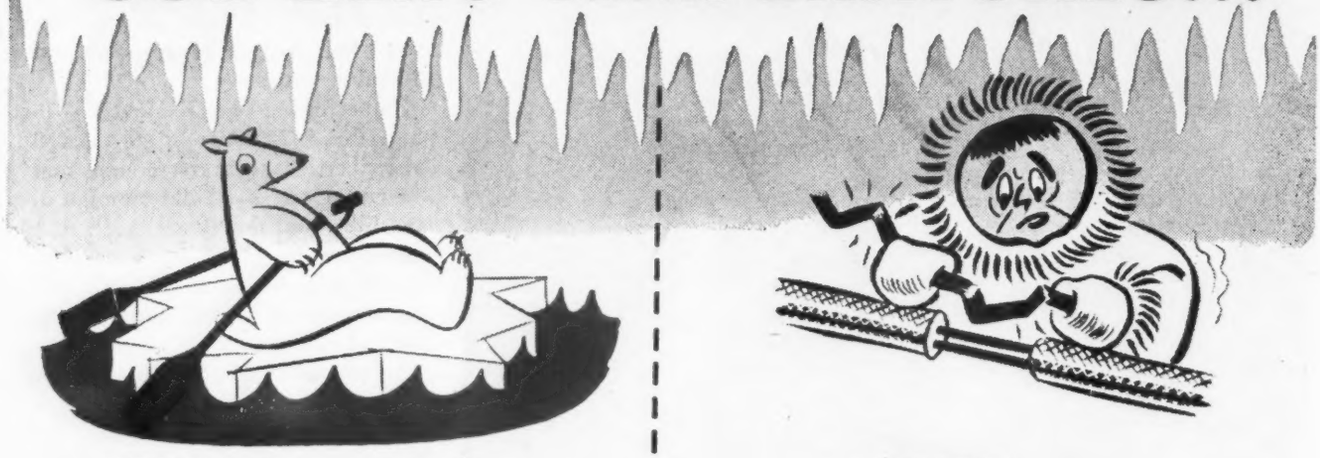
THE TRANSISTOR, the tiny electronic amplifier invented at the Bell Telephone Laboratories and called the first serious rival of the vacuum tube, went to work in the nation's telephone system for the first time Monday, Oct. 20, when it was used in a trial installation in dial switching equipment at Englewood, N. J.

Englewood is the scene of the introduction of customer long-distance dialing, through which New Jersey Bell Telephone Co. customers there are able to dial direct to telephones in such distant cities as San Francisco, Chicago, and Cleveland.

The new transistor units in the Englewood trial are generating the electrical signals by which the numbers of the called telephone are sent from one central office to another. Without transistors, this is accom-

(*Please turn to page* 20)

SUB ZERO TEMPERATURES...



PERFECT for Polar Bears

TOUGH on Tapes

It's never too cold for

*BI-SEAL® SELF-BONDING INSULATING TAPE

Wrap it . . . twist it . . . stretch it! Even at temperatures as low as 40° below zero, Bi-Seal still retains its extreme flexibility and remarkable self-bonding characteristics. It's the answer to your cold-weather wire and cable splicing problems . . . an easy-to-apply, permanent electrical insulation and moisture-seal that is completely impervious to weathering.

This tested and proven multi-purpose electrical insulating tape is unaffected by acids, sunlight, corrosion, ozone and fungus. It has an average dielectric strength of over 1000 volts per mil and will perform effectively with any type of insulation. It can be stored indefinitely without deforming or deteriorating.

Don't wait . . . head off your cold weather splicing problems NOW! Send for full details today!

OTHER ADVANTAGES OF BI-SEAL

- NO STICKY ADHESIVES . . . EASIER TO APPLY IN CLOSE CLEARANCES
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* POLYETHYLENE BASED COMPOUND

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BI-SEAL

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MANUFACTURING CORPORATION
CEDAR GROVE, NEW JERSEY

Attach this coupon to your company letterhead and mail to: **Bishop Manufacturing Corporation, Dept. TE Cedar Grove, N. J.**
Please send sample and complete information on Bi-Seal to:

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"We Don't Need Any Help"

● Directory advertising can . . . and does sell itself these days...to a point. Practically all telephone companies are increasing directory advertising revenues. Don't be complacent about *any* increase...it may fall far short of the potentialities of your service area. We invite you to call or write Loomis today for an analysis of your directory...without obligation on your part.

KNOW-HOW TO SOLVE YOUR DIRECTORY PROBLEMS

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● 724 cities and towns in 22 states are served by the 287 directories that retain Loomis services.

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FIRST NAME IN BRUSH KILLERS

REPORT:

Winter Basal Bark Spraying

It is smart, economical management to control brush along utility rights-of-way by dormant basal bark spraying. This is true for all sections of the country. It is particularly recommended for cotton...tobacco...truck crop regions.

Successful, highly effective kills are obtained at low cost. In addition to the economy of the operation, often there is more efficient use of available manpower. Permits brush clearance along lines in fields where susceptible crops hinder summer spraying. Recommended, too, for spot clearance.

These benefits are proven not only by intensive research on Thompson experiment stations but by the field experience of many REA Co-ops, electric and telephone companies along hundreds of thousands of miles of line.

WHAT TO USE

For utmost economy and assurance of positive kills, we recommend our specially developed, modern low volatile brush killers:

BRAMBLCIDE
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BRAMBLE-WEEDICIDE
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These brush killers are non toxic for humans or animals. They contain HS-31 for extra creep and extra kill. They are unmatched for efficiency and economy by any other known product.

Please write for data sheet on mixing and spraying and for price schedule.

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St. Louis 3, Missouri
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plished by vacuum tubes in a large assembly serving a number of circuits within a single central office, and signals thus generated must be distributed through special cable to the individual circuit.

With the new transistor equipment —much smaller, and less expensive than the vacuum tube units—the signaling equipment, instead of being centrally located, can be placed exactly at the points where it is needed. The new units, unlike vacuum tube units to which heating power must be continuously supplied, operate only when needed and use very little power. They also require less maintenance, Bell Laboratories pointed out.

The transistor units, or oscillators, are used in sending out electrical signals in the form of six musical tones of varying frequencies, combinations of which represent the digits of a telephone number. After being transmitted, the musical tones are converted back into ordinary electrical signals at the receiving central office.

In addition to use in the new oscillators, transistors are also going to be employed in other telephone equipment within the next few months, the Laboratories reported. Two types will be used in equipment known as "card translators," now undergoing final development.

When installed in central offices, the translators will serve as automatic routing devices for setting up long-distance calls. They will signal the automatic switching systems, telling them what route the call should take, and the type of electrical signaling to be used in reaching the called party, and what to do if the first route is found busy. For the average call, this equipment will perform its translating function in about a third of a second.

Indiana Bell Asks FCC Approval Of Purchase

CITING THAT the plant of the companies to be acquired is inadequate to render good telephone service, but that with substantial replacements and additions and with improved methods of operation, adequate and satisfactory telephone service will be provided, the Indiana Bell Telephone Co. last month asked FCC approval of its proposed acquisition of the "east side" properties of the John T. Detchon estate.

The Indiana Public Service Commission approved the transaction earlier last month, after a hearing at which residents of the communities involved strongly favored purchase by Indiana Bell. The company and the Detchon estate have agreed to a net price of $874,000 for the property, which includes the 3000-station Noblesville Telephone Co., in which Mr. Detchon owned a majority of the stock, as well as the "east side" properties which he owned solely.

About 16,000 telephones are served by the companies to be acquired. In all, 24 exchanges are involved. Indiana Bell pointed out in its application that the companies have a number of held orders which in most instances cannot be filled without additions to their plant, and that they do not have the necessary funds to provide the replacements and additions.

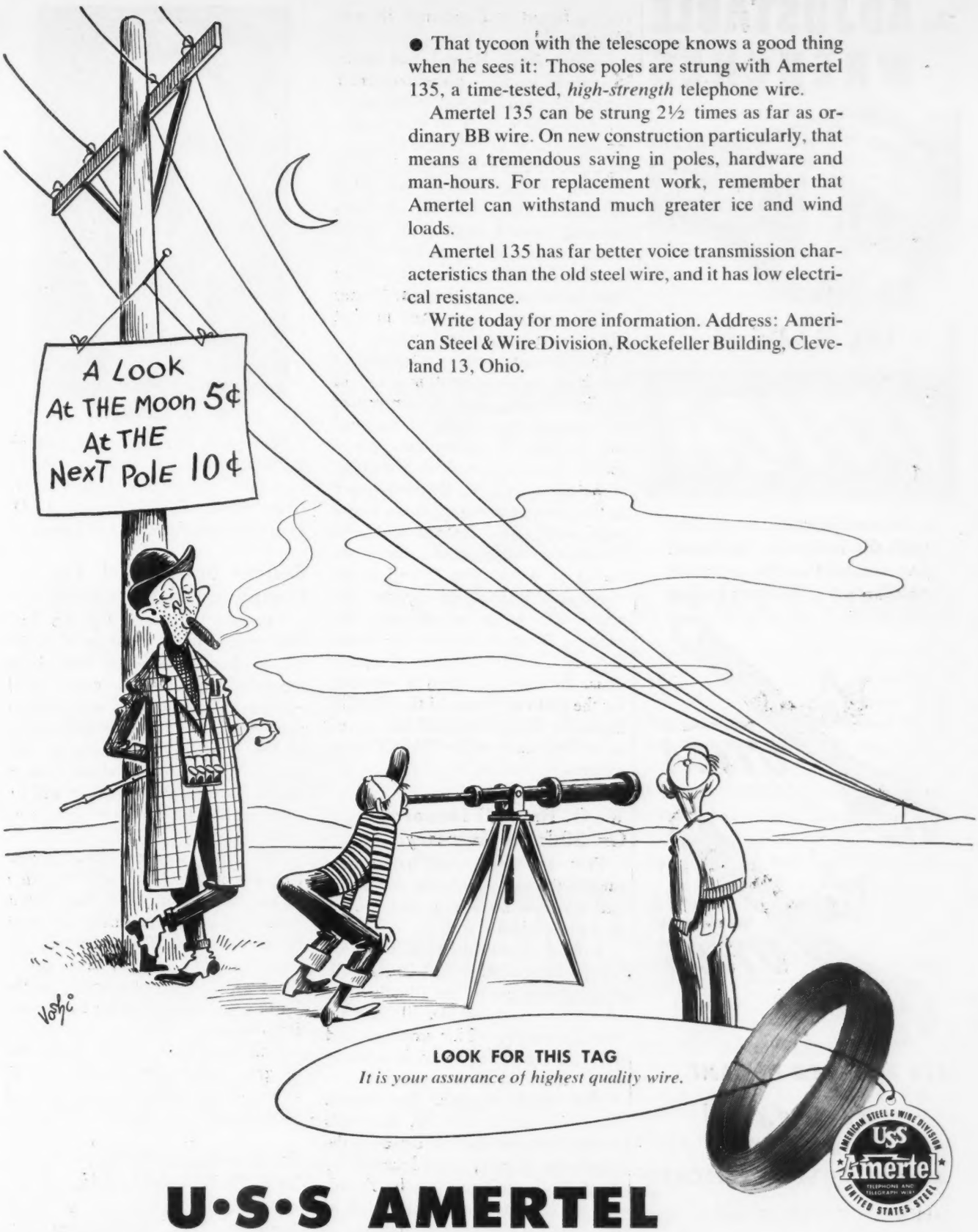
FCC Examiner Approves So. Bell Acquisition

IN ANOTHER DECISION handed down speedily following hearings, FCC Examiner Herbert Sharfman Oct. 23 issued an initial decision looking toward approval of the proposed acquisition of the Harlem (Ga.) Telephone Co. by the Southern Bell Telephone & Telegraph Co. Hearing on the application was held Oct. 9. In view of the absence of opposition to the application, the initial decision is expected to be made final automatically.

Southern Bell, under the transaction already approved by the Georgia Public Service Commission, is acquiring property serving about 230 customers. Frequent service complaints have been made by the residents of the area, and 70% of the present subscribers signed a petition to have Southern Bell take over the service. There is an unfilled demand for 300 telephones, it is estimated, as Harlem is near Camp Gordon, Ga., and many of its personnel live in the community.

Commissioner Morgal Dies; 35 Years With State Body

ONE OF THE ablest state commissioners in the nation, who rose through the staff ranks to that post, Commissioner B. Frank Morgal of the Pennsylvania Public Utilities Commission, died from a coronary heart attack Sunday, Oct. 19, while



● That tycoon with the telescope knows a good thing when he sees it: Those poles are strung with Amertel 135, a time-tested, *high-strength* telephone wire.

Amertel 135 can be strung 2½ times as far as ordinary BB wire. On new construction particularly, that means a tremendous saving in poles, hardware and man-hours. For replacement work, remember that Amertel can withstand much greater ice and wind loads.

Amertel 135 has far better voice transmission characteristics than the old steel wire, and it has low electrical resistance.

Write today for more information. Address: American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

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It is your assurance of highest quality wire.

U·S·S AMERTEL

TELEPHONE & TELEGRAPH WIRE

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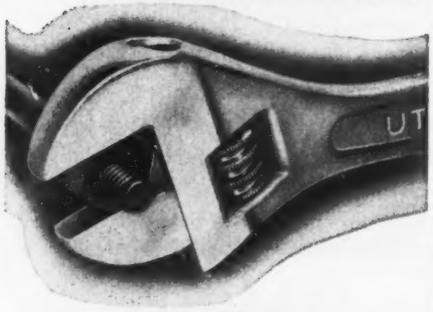
UNITED STATES STEEL

For ADJUSTABLE WRENCHES



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... the adjustable wrenches with the induction hardened jaw surfaces — *the wrenches that last up to 10 times longer*

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Available in 4", 6", 8", 10" and 12" sizes.

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IT PAYS TO BUY QUALITY TOOLS
and the world's best tools are made in U.S.A.

visiting friends at Pittsburgh. He was 57 years old.

Commissioner Morgal had spent 35 years of his life—his entire career—with the Pennsylvania commission. He started as a clerk in its accounting department in 1914 and after taking night college courses and a period of study at the Wharton School of Business of the University of Pennsylvania, rose through posts of increasing responsibility to become the Commission's Chief Accountant. In 1940 he was appointed commissioner and had served since then in that office, being reappointed twice.

The Pennsylvania Commissioner had been an important member of the Special Telephone Committee of the National Association of Railroad and Utilities Commissioners for a decade, having started as a member of that group in 1943. He participated in the Telephone Committee's major tasks with active interest and with constructive contributions during the period of World War II and in the recent significant studies by the committee into telephone toll rate disparities, Western Electric Co. prices and costs, and the revision of separations. He also had been a member, for the past two years, of the NARUC Executive Committee, and had served on several other major NARUC committees.

W. O. Randall Honored On 50th Anniversary

FEW MEN EVER spend half a century in the same business, and fewer still attain a 50-year service record at the age of 64.

Both of these distinctions, however, have been attained by W. O. Randall, district manager of the Illinois Telephone Co., Jacksonville, Ill., and recently a number of his employes and associates gathered to do him honor at an informal dinner party.

The speech-making, the central theme of which was Mr. Randall's unusual and outstanding career in the telephone industry, was handled by R. B. Still, chairman of the Board, and H. H. Butler, president, both of the company's general offices at Bloomington. Mr. Butler, on behalf of those present, presented Mr. Randall with a watch, suitably engraved, to which he gave appropriate and retrospective response. Others who were in attendance and were called upon for brief remarks included, B. C. Schweitzer, Fox Henderson, George W. Wopat, Leon F. Roberts, Homer C. Swartz, Homer Joy, J. B. Cherry, Nyle Scholl, E. W. Brown, J. O. Fellhauer and Robert L. Holman.

W. O. RANDALL

Eastern Indiana Tel. Co. Completes Dial Program

EASTERN Indiana Telephone Co., Winchester, has announced that its 17 telephone exchanges have been converted to dial operation. Dial equipment at Lynn, Ind., was put into service on Sept. 25 and all subscribers of the company are receiving dial service except a few rural subscribers on the Lynn exchange. They will be cut over line by line as soon as possible.

The company operates two toll centers, one at Winchester and the other at Cambridge City, Ind. Nationwide intertoll dialing equipment has been in service at the Winchester toll center since 1950 and the same equipment will be put into service at the Cambridge City toll center in the next few months.

This completes a dial conversion program which was started in 1947 at which time the company operated nine manual exchanges.

So. Continental Plans New McMinnville Bldg.

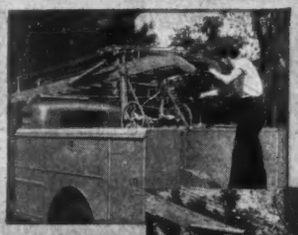
WOOLWINE, Harwood & Clark, Nashville, Tenn. architectural firm, has been selected by Southern Continental Telephone Co. to prepare plans for the new building which will be erected for the company in McMinnville, Tenn.

Southern Continental's President,

(*Please turn to page* 65)

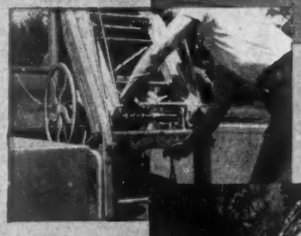
THIRTY FEET HIGH in THIRTY SECONDS

Simple, Easy, One-Man Operation

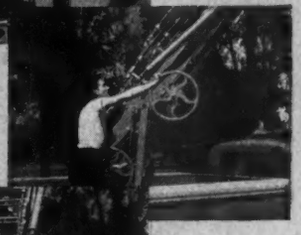


1. Ladder hold-down on cab roof is released.

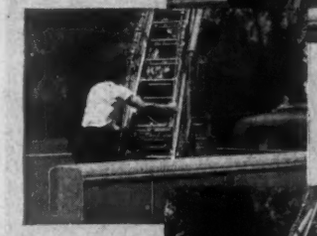
2. Pressure is applied to lower ladder rung.



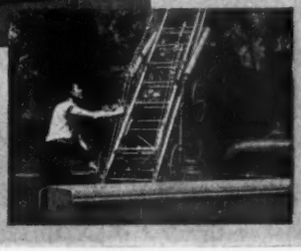
3. Ladder is locked in elevated position.



4. Upper section is extended to desired height.



5. Ladder is rotated to spotting position.



6. Incline of ladder is adjusted as required.

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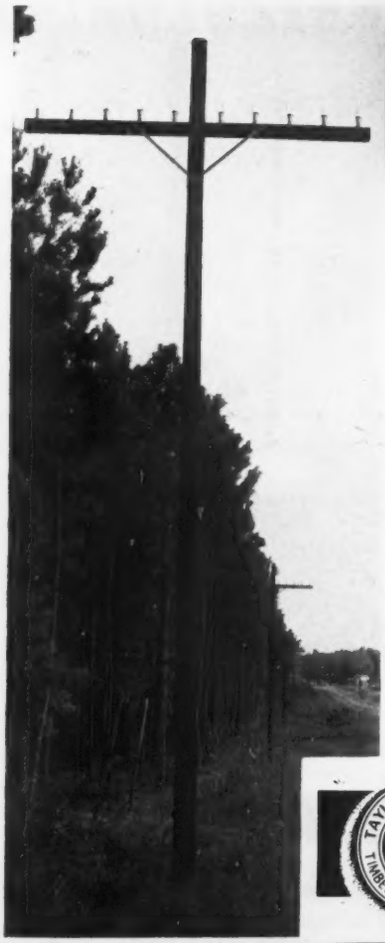

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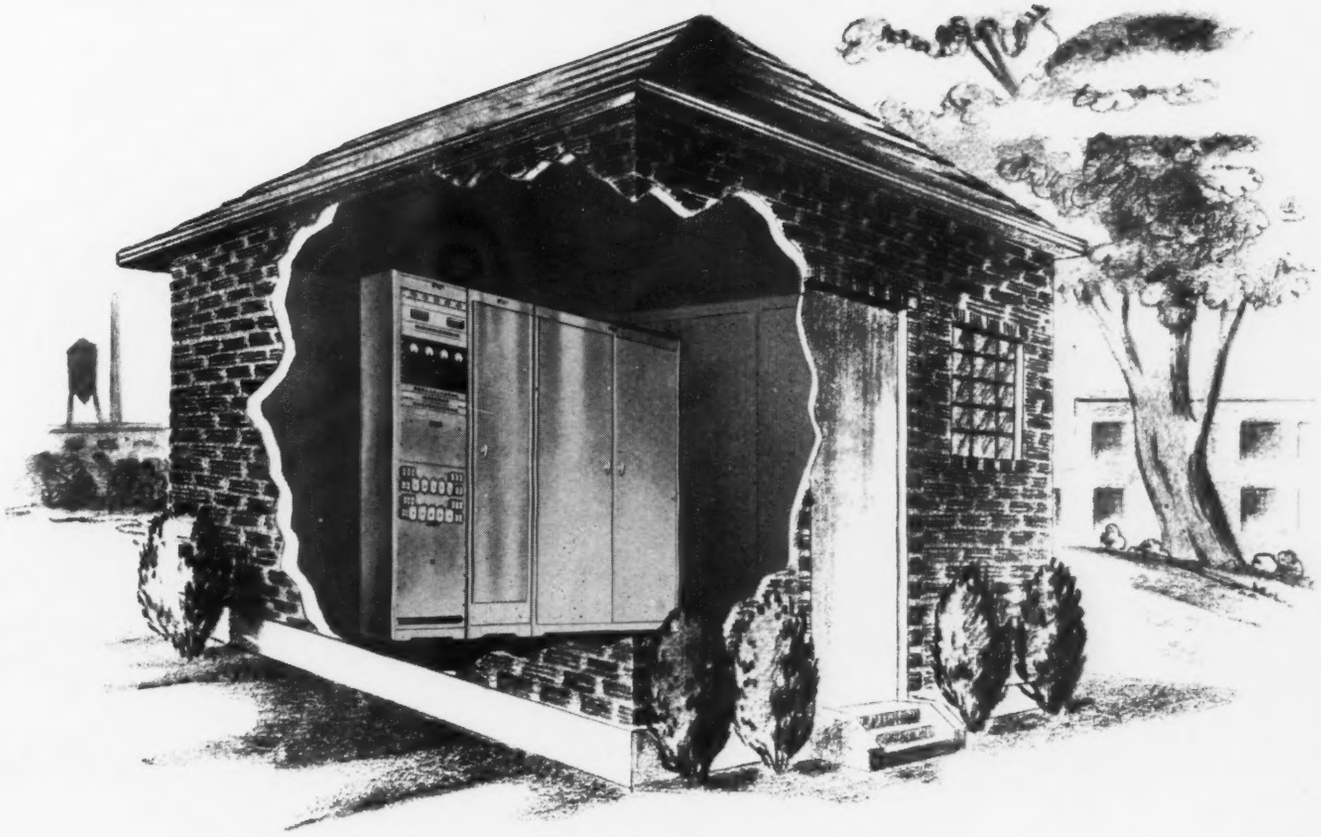

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Though seldom a word is spoken within its walls, it carries more conversations than any building in town. The butcher, the baker, the defense goods maker, the banker and the order taker, all would find normal conduct of their daily lives impossible without the swift, efficient passage of their voices by the silent servant in residence here.

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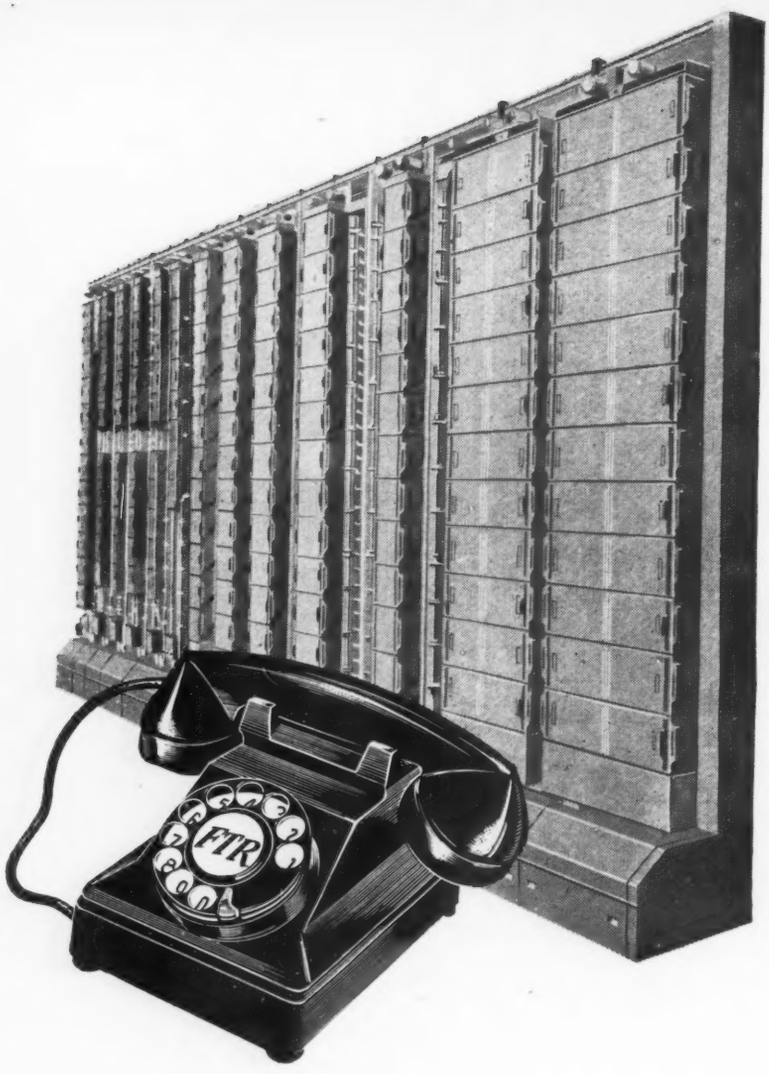

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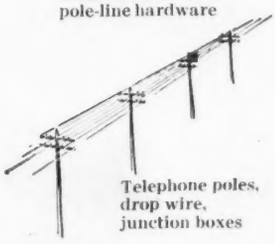
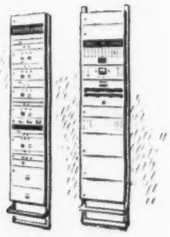
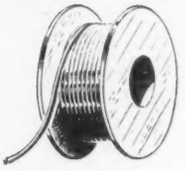


Telephone poles, drop wire, junction boxes

Teleprinters



Carrier wire transmission systems



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EDITORIAL

Commission Regulation Is On Trial

THE YEAR OF 1953 will be a fateful year for the telephone industry.

Whether that fate is good or bad depends largely, we think, on two things.

One is the vigor and perseverance with which telephone companies insist that their rates for service be sufficient to produce revenue adequate for their needs.

The other is the extent to which regulatory commissions measure up to their responsibilities and deal with telephone rates, revenues and earnings on a basis of reality.

Under existing conditions, telephone rate cases should not be contests between commissions and companies to determine whose ideas about rate-making should prevail.

Ideologies of rate-making can be fought out—if anybody wants to fight them out—at some future time when the struggle for enough revenue to keep the business going, and enough new capital to permit it to expand, has become less acute. You don't go around washing windows when the house is burning down.

The thing that counts in a utility rate case—and the U. S. Supreme Court itself has said it—is the end result.

Both commissions and companies know what that end result needs to be in a telephone rate case.

They know that, regardless of how the rates are arrived at, the revenue produced must be sufficient to cover expenses, taxes and depreciation, and that enough income should then remain to pay fixed charges and dividends and leave a reasonable amount for surplus.

They know that the rate of dividends paid must be high enough to attract new equity capital, since expansion cannot be safely done on debt alone.

The economics of this situation are clear and simple. Some commissions are facing them factually and are doing their utmost to meet the situation.

But in some commission jurisdictions the process of trying to obtain very necessary increases in rates is a dog-fight from start to finish, with the finish usually wholly inadequate to meet the company's necessities.

We think that in such jurisdictions utility regulation by commission is on trial; that the question is whether commission regulation is living up to its responsibilities there, and consequently that of the practicality of fixing utility rates by such method at a time like this.

Admittedly, these are difficult times for commissions as well as for telephone companies.

The apparently unceasing heavy public demand for more telephone service; the current high cost of the expansion of telephone facilities; the week-by-week increase in the costs of operation; the need for a large and constant flow of new capital into the business—all these and other things have created a situation without precedent.

It is a situation which requires that both commissions and the public recognize the fact that there is no magic by which the telephone industry can escape the consequences of inflation, and that telephone companies can live and grow under present conditions only if telephone rates are put on a level reasonably comparable with the present cost of other things.

Much is said about the responsibility of the telephone industry to supply service. That responsibility can be met only if commissions, too, live up to their responsibilities.

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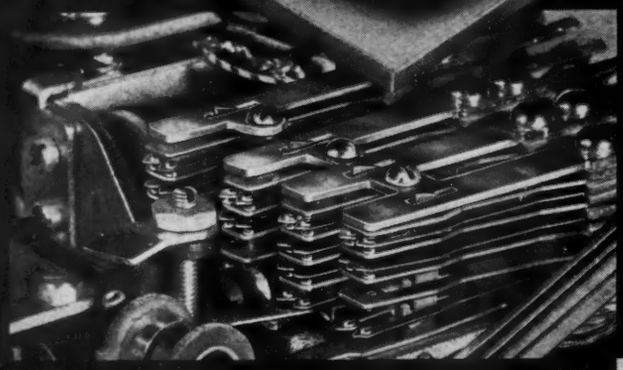
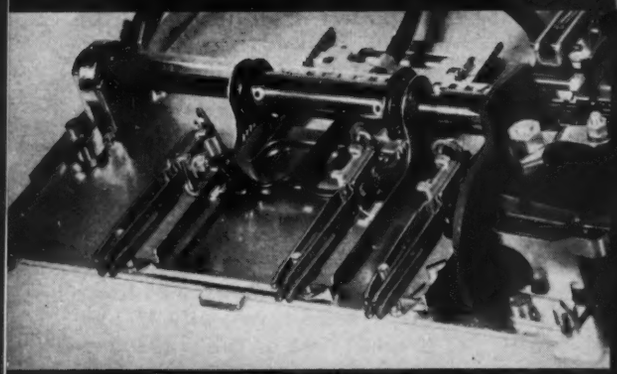
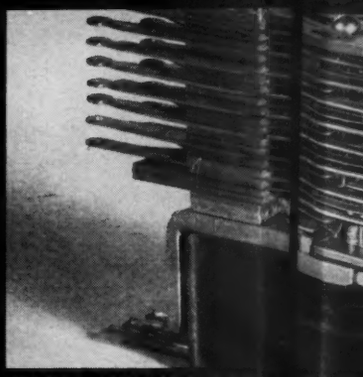


On the XY Switch spring pile-ups



On the XY Switch wipers



On the "A" and "C" Relay spring pile-up

STROMBERG-CARLSON Factory, General Offices: Rochester 3, New York Branc

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Stromberg-Carlson uses twin contacts in six all-important places, illustrated in the accompanying photographs.

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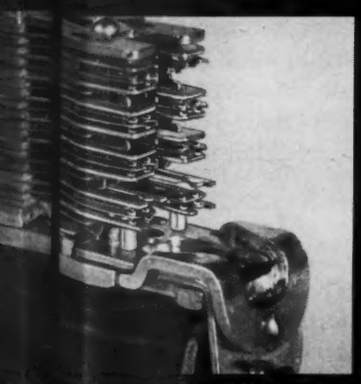
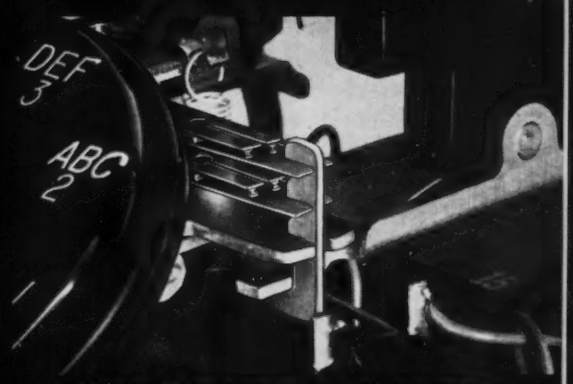


pring pile-ups, series "500" and "700"



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ork Branch Offices: Atlanta 3, Chicago 6, Kansas City 8, San Francisco 3. In Canada: Stromberg-Carlson Co. Ltd., Toronto

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Easy speed makes a splice or dead-end with this Reliable method. Most cable spinning machines pass the Strandlink with ease. Some require only that traction rollers be opened.

For ¼", 5/16" and ⅜" strand.

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OVER 45 YEARS SERVICE TO THE TELEPHONE INDUSTRY

Hoosier Telephone Co-op case may become guidepost in rural telephone matters for telephone companies, REA, and regulatory authorities.

Washington Bureau Reports

By ROLAND DAVIES and FRED HENCK

AS OCCASIONALLY happens, one of the most important developments in recent weeks affecting the telephone industry, despite a strong Washington tie-in, has taken place some hundreds of miles from the national capital.

No one spending any time in telephone circles—both industry and government—in Washington, however, would assume that interest in the newly-formed Hoosier Telephone Cooperative, and the Indiana Public Service Commission's hearings on the subject, stops at the borders of the Hoosier state.

The case, regardless of its outcome, has the earmarks of becoming something of a guidepost in rural telephone matters, for telephone companies, the Rural Electrification Administration, and regulatory authorities.

Several months ago, REA announced by far its largest telephone loan allocation, $6,618,000, to the newly-formed Hoosier co-op. The organization, which will become a major telephone operator if everything goes through according to its plans, would acquire the "west side" telephone properties of the John T. Detchon estate, 13 small companies in Indiana and two in Illinois.

Unlike the usual REA equity requirement—which comes down in general to existing companies using their plant as equity and newly-formed groups making cash assessments—the Hoosier co-op borrowed $286,000 from electric co-ops to meet the equity rule.

Now, after two sessions of hearings, Hoosier's path is far from smooth. A rising tide of protest has carried the hearings through about six separate days of sessions, and they are not completed yet. Indiana newspapers strongly blasted the transaction as evidence of government competition with private enterprise. Businessmen and other private citizens in the affected communities filed protests, hired attorneys, and appeared before the commission to oppose the co-op's request that it be given the necessary approvals.

Counsel for some of the intervenors joined forces with the commission's Public Counselor, Walter F. Jones, Jr., to charge during cross-examination that the co-op's proposed financial structure is "shaky."

Specifically, it was brought out in questioning of the co-op's accounting witness, G. G. Skelton, that the organization's estimated annual net income of $112,000 would not permit amortization of the REA loan. Mr. Skelton declared that the anticipated net, which is based on a 70% increase in pre-station local revenue, a sharp boost in per-station toll revenue, and a rise of 4500, or upwards of one-third, in the number of telephones served, would not permit retirement of any of the REA debt.

Subpoenaed by attorneys for some of the groups opposing the purchase, Indiana Bell Telephone Co. Assistant Vice President Russell R. Hirschman testified that his company would be willing to buy the exchanges at the appraised value of $780,000 if for any reason the co-op is unable to proceed with its plan to obtain and operate the properties, or if it does not get the commission's approval.

Indiana Bell did not submit a bid on that part of the Detchon estate, although it is acquiring the "east side" part of the Detchon properties.

Legal points raised during the session pertained particularly to the co-op's lack of any equity capital, and the contention the group is not properly organized under the 1951 Indiana rural telephone legislation. The co-op's equity capital, as required by REA, actually is borrowed from rural electric cooperatives, and therefore is simply more debt capital, it was emphasized. In addition, it was declared, organization under a 1935 law relating to non-profit corporations is improper, on the basis that the 1951 rural telephone statute preempts the field and applies specifically.

Frequency Allocations

TWO FREQUENCY allocation proposals, one or both of which would affect existing assignments to the common carrier fixed, land and mobile, and operational fixed (including private communications systems) radio services, have been submitted to the Federal Communications Commission by theater television advocates looking for a place in the spectrum.

Seeking a total of 420 megacycles for a theater television service in the area below 7125 mc, engineering witnesses for the Motion Picture Association of America and the National

Exhibitors Theater Television Committee submitted the request for revision of existing allocations after concluding that space allotted to the government, amateur radio operators, and radio navigation should not be disturbed.

After four and a half days of sessions needed to present most of the MPAA-NETTC engineering and accounting material, the hearings were recessed until Jan. 12. At that time, the FCC will first hear Manfred K. Toeppen, motion picture witness on cost and investment required for a separate theater TV network system, and then will take up testimony on broad policy, statements by other parties in the case, and cross-examination.

The US Independent Telephone Association, opposing the application, is represented at the hearings by Attorney Norman S. Case.

The theater TV witnesses presented two alternative frequency assignment plans. One would be to allocate most of the 5925-6425 mc band, now assigned to common carrier fixed station operations, solely for theater television. The other would be to classify theater TV as an industrial radio service, and permit it to use the 6575-6875 mc area, allocated to operational fixed stations, and the 6425-6575 mc band, set aside for land and mobile service, on a shared basis.

If there is insufficient space remaining for common carrier operation, the theater TV proponents said, attention should be given to future needs of the mobile services, particularly in the 3500-3700 mc band, to see if common carrier operation could not be conducted there.

Of the various frequency bands mentioned, two are now occupied by operating stations to some extent—5925-6425 mc and 6575-6875 mc.

Both the 3500-3700 mc band, for the land mobile services, and the 5925-6425 mc area, for the common carrier fixed stations, are regarded as the next logical points for widespread use, as equipment development continues and lower bands allocated to these services become further saturated.

FCC sources indicated, for example, that the 3700-4200 mc common carrier band is rapidly being filled up, so that, in the orderly development of common carrier services, the 5925-6425 mc area is the next place to go. A similar situation applies to the mobile radio services.

Counsel for MPAA-NETTC did not answer directly numerous questions as to whether they will recommend a specific type of organization to handle theater TV service, if the frequencies are allocated by the Commission.

They emphasized, as they did at a press conference before the hearing, that the current case is an allocation, not a licensing, proceeding, and that the question of who should be assigned the frequencies should await an FCC decision making the necessary allocation.

COMING CONVENTIONS

"There has never been a time . . . when it was more necessary for telephone people to take common counsel upon common problems."

Oklahoma Telephone Association, Hotel Tulsa, Tulsa, Nov. 20 and 21.

Louisiana Telephone Association, Jung Hotel, New Orleans, Feb. 12 and 13.

Minnesota Telephone Association, Hotel St. Paul, St. Paul, Feb. 17, 18 and 19.

Kentucky Independent Telephone Association, Phoenix Hotel, Lexington, Mar. 3.

Texas Telephone Association, Baker Hotel, Dallas, Mar. 9, 10 and 11.

Nebraska Telephone Association, Cornhusker Hotel, Lincoln, March 24, 25.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 7 and 8.

Illinois Telephone Association, Hotel Pere Marquette, Peoria, Apr. 15, 16, and 17.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 12, 13, and 14.

United States Independent Telephone Association, Executives' Conference, Edgewater Beach Hotel, Chicago, May 25 and 26.

Pennsylvania Independent Telephone Association, Pocono Manor Inn, Pocono Manor, June 3 and 4.

"There is no quick, easy way to the acquisition of knowledge . . . but at a convention there will be ready-made answers to perplexing problems."

"Two-Party System Saved"

LONG-RANGE political predictions are among the most hazardous of guesses. But it is easy to foresee that in a comparatively short period, if GOP Congressmen and Senators repeat some of the misakes of intemperate public statements and poor relations which obscured their generally solid record of achievement in the 80th Congress, the balance of power in Washington again will shift.

For the sake of the two-party system, and because of the obvious need for a change in Washington, the nation is fortunate that a national hero and a great man was available to run as the Republican candidate for President.

This strongly pro-Ike column believes that our President-elect has the qualities of leadership, team spirit, integrity, vision, and complete dedication to the old-fashioned virtues to go down in history with our greatest Presidents.

But he is a once-in-a-lifetime leader. The Republican party has not demonstrated that, as a national group, it has emerged from minority status to the 50-50 position that the health of the two-party system demands. It now has the opportunity to achieve that position.

Two men in two years, Senator Taft in the 1950 Ohio Senate race and General Eisenhower this year, have without exaggeration saved the two-party system. It is now up to a few hundred Congressmen and 48 Senators, equally as much as the new national administration, to keep it safe.

"Theories and techniques in presenting a rate case may cause delays beyond the control of the regulatory commission."

That Drag Between Petition & Order

By Hon. JOHN C. DOERFER*

RAY RIORDAN, secretary of the Wisconsin State Telephone Association was quite disturbed about the present regulatory lag between petition and order. He prevailed upon me to discuss this problem today and suggest some possible remedies. With all due respect to Mr. Riordan, it reminded me of the farmer who had occasion to visit his family physician, a somewhat breezy and unassuming person. The farmer complained that he had spots before his eyes and blotches on his chest and felt bad all over. "When did you first notice this, Bill?" inquired the Doctor. "Well, Doc, I had it in the 1920's, then sometime during the 1930's, again in the 40's . . ." The Doctor then looked at him closely and said, "Damnation, you got it again!"

Although I will suggest some remedies, I do make the same observation. Utilities have had "lag" trouble at various times during the past 40 years and "they got it again!"

In a recent case, a utility had contended before a United States Court of Appeals that rates ultimately fixed by the Federal Power Commission should have been retroactively effective through a 5-month suspension period. In denying that contention, the Court said:

> "It is true, of course, that a utility is entitled to rates that are just and reasonable but this is not to say that rates must fluctuate automatically with every change in economic conditions or that a reasonable time may not be allowed for determining the reasonableness of a proposed increase in rates before it is allowed to go into effect. Any loss sustained by a maintenance of the status quo while such a determination is being made is properly considered, not as a violation of a constitutional right, but as a *necessary incident of rate regulation* so long as the period of suspension does not overpass the bounds of reason. . . ."—*Hope Natural Gas Company v. Federal Power Commission,* (*C. A.* 4) 196 *F.* (2*d*) 803 (*May* 14, 1952).

Large Number of Applications

ONE of the contributing factors to regulatory delays is the tremendous work load thrust upon commissions and their staffs during present times. Because of the force and extent of repeated shocks of inflationary measures upon our national economy, nearly every utility subject to commission jurisdiction has sought rate relief within the last four years. In many cases there have been four or five applications by the same utility.

Present commission staffs are not geared to dispose promptly of such extraordinary numbers of applications. Nor can such staffs be easily expanded to meet these unprecedented demands. Commissions do not have the necessary appropriations or facilities to automatically enlarge a staff in direct proportion to the work load; and even if they did, there is not enough skilled talent available. Commissions have difficulty in the face of competition from industries in retaining their present experts let alone finding additional ones. Hence, the possibility of reducing the "lag period" by increasing the staff is a slim one.

Administrative Procedure Acts

ANOTHER cause of delay is occasioned by complying with the strict provisions of the administrative procedure acts which make public service commissions more of a judicial than a legislative adminis-

**Mr. Doerfer is chairman of the Public Service Commission. The address was presented at the recent USITA Convention.*

trative body today. The original conception that an administrative agency was to be more of a legislative committee of experts with highly trained personnel than a judicial body has undergone a change. Agencies were not to be considered as courts bound by common law or statutory rules of evidence or procedure.

Although this is still the general idea, both city attorneys and public utilities, when it is to their respective advantages, urge and contend for the application of technical rules more characteristic of a court than a legislative tribunal. Today, however, utilities are more receptive to informal procedures if it will hasten determination and realization of rate increases. But there are some principles of due process and equal protection of the laws inherent in our democratic system which regardless of their delaying effect should be retained.

The elements of fair play such as ample notice of a hearing to persons who may be adversely affected or their representatives should not be discarded. There should be retained an opportunity to present and counter all relevant and material evidence to the end that a full and complete hearing will be had. There should also be retained the right of appeal and review. These procedural steps do take time.

Admittedly, the democratic process of determining rights and obligations of a public utility is not always an efficient one. The short cuts of a dictatorship or police state may be more efficient but who wants that? We Americans prefer, and rightly so, to endure delays rather than sacrifice the essential safeguards of our democracy. Therefore, any proposed improvements of administrative procedure acts should not tend toward a destruction of the fundamental requirements of notice and a fair and full hearing. Attacks against delays should be within the framework of these fundamentals and not against them.

Theories and Techniques

THEORIES and techniques in presenting a rate case may cause delays beyond the control of a regulatory commission. One is the insistence by utilities that the current value or reproduction new less depreciation theories as against the net cost investment theory be considered by commissions.

The most important and ultimate objective of a utility is to secure a rate which will allow that utility to recover sufficient earnings to attract investment capital. The utilities are well within their rights to assert their concepts but such concepts are time consuming; in my opinion, they are not necessary to the sought-for end result. Admittedly, a just and reasonable rate should be one that will permit a utility under prudent management to recover its reasonable operating costs including taxes leaving net earnings sufficient to obtain needed capital in the financial markets at favorable terms.

For a utility to urge a commission to adopt a rate base reflecting present market values, or current values, or reproduction new less depreciation values is an invitation to a long investigation and, hence, interminable delays. Admittedly, much can be said, has been said, and will continue to be said about the relative merits of a net cost investment base as against current or reproduction valued rate bases.

However, it must be obvious that the most expeditious way of determining a rate base is to present a net cost investment base. It merely requires the presentation of a resume of the company's records which generally have been and are being kept in compliance with the classification of accounts. It does not require a comprehensive investigation and inventory by valuation experts, and what is more time consuming, observed depreciation studies.

Application for a rate increase is not an appraisal proceeding as though a sale of the utility properties were impending.

There is no convincing evidence that those commissions adopting a net cost investment base have forced any utilities into bankruptcy or even stringent financial conditions by the mere adoption of that method of valuation. It may be that some commissions because of political expediency, callousness, or even honest miscalculation hold back the full measure of a just and reasonable rate. But that is really an indictment against a frame of mind rather than an equitable concept of regulation.

In any event, I do not propose to belabor the merits or the demerits of the various valuation theories. I merely wish to point out that a fair and just result can be had by eliminating one of the invariables in a rate proceeding and concentrating on but one important variable, to wit: What rate of return is essential to enable a utility to compete to good advantage for itself and the public in the financial markets for needed capital? A utility approaching a rate case urging a consideration of current or market values does select a comparatively long and tedious road to rate relief.

There is no magic in the proverbial "6 per cent rate of return." If more is required to attract capital, it is the plain duty of a commission to allow it. The Wisconsin Commission in a recent case indicated it would approve any rate of return on a net investment cost rate base deemed necessary to achieve a reasonable end result and that there was no necessity for attempting to beguile or befuddle the public by applying a seemingly low rate of return to an inflated rate base. Such an approach does save both time and money in a rate case.

There is no convincing evidence that the mere adoption of a net cost investment basis has caused any utility financing difficulties. Many of the fears expressed have been speculative at best. At present the "verdict of the financial markets" belies the fears expressed to date insofar as any Wisconsin utility was concerned.

The Wisconsin Commission has after considering the various valuation theories decided to adhere to the net cost investment basis. This is now well known by utilities subject to our jurisdiction and they have reacted accordingly. Consequently, those utilities which have acquiesced in our judgment do enjoy comparatively quick rate relief. The average time between the filing of an application and a final order is about 3 months. The range is from 20 days to one year.

The case that took a year involved a consideration of the company's theory of "current values". The same company subsequently received a rate increase in less than four months upon a "make whole" theory in which its concept of current values was "laid on the shelf"—at least for the purposes of that case.

Considering that there are about 1100 public utilities in Wisconsin and nearly every one having at least one or more applications processed during the past four years, the Wisconsin record for disposal of rate cases is not too bad. In any event, the time element would have been much greater had we given any extensive consideration to values other than the net cost actually recorded upon the books and with which we were familiar.

Depreciation

GENERALLY various theories or any theory of depreciation is a fruitful source of long controversy and accounts for a good portion of the regulatory lag. Another advantage of a net investment cost rate base is the facility with which a Commission can dispose of this problem.

The usual practice is to merely deduct the book depreciation reserve to ascertain the net cost of the depreciable property. The Wisconsin Commission having statutory authority to prescribe annual depreciation rates does so in a separate proceeding. Where such rates have been duly determined and certified (usually after notice and hearing) neither the annual depreciation expense nor the accrued depreciation reserves are in issue. In many cases, these determinations have been made long before a rate case and cannot be questioned therein by the utility, municipalities, or impeached by the Commission.

In essence, this practice disposes of a highly controversial and time consuming issue apart from a rate case and is feasible only with a net investment cost concept. Once a certification has been made, it is rarely challenged or relitigated. It has not only the virtue of definiteness and stability for years but contributes materially to a prompt and expeditious determination of a rate case.

Serving Applications and Exhibits Upon Probable Opponents

A UTILITY can also aid in reducing the hearing time by adopting such simple expedients as serving upon municipalities within the area to be affected, copies of proposed testimony and exhibits. Such a practice has been followed in some rate cases in Wisconsin. It saves time by enabling municipal attorneys to study the company's case before the hearing. The company must present its full case eventually so why should it not submit as much as possible before the date set for hearing?

Study by possible opposition during the interval between the filing of the petition and the date set for hearing frequently eliminates senseless cross examination prompted by lack of understanding of the company's financial status and operating experience. Commissions should also be served with such proposed evidence upon the filing of the petition. It will afford the staff an opportunity to study and examine much of the relevant material before the hearing. It also enables the staff to call for such additional records and information which it deems material for commission consideration long before it would otherwise be requested and furnished.

Commissions, not being juries, can receive such evidence in the record without oral repetition under proper safeguards. The Wisconsin Commission has received such testimony after the witness who has prepared it has appeared before the Commission in person and taken an oath that if he were asked such questions, he would make such answers, and after the opposition has had an opportunity to examine it with leave given to make objections and motions to strike upon valid and legal grounds.

Make Whole Applications

ANOTHER way to cut down the delay in presenting a rate case would be to adopt the "make whole" approach mentioned before. This applies only to repeat or subsequent applications. Once a utility has been before a commission in a full fledged rate case and has had extensive consideration of its application and after

NO. 1 REAL ESTATE OPERATOR

the commission has indicated and adopted a policy with respect to rate base, rate of return, and allowable expenses, the utility, if it is interested in a speedy determination in a new case because of a subsequent tax or wage increase, should acquiesce in the commission's determination of the previous issues and seek to recover only the subsequent but additional and necessary expenses. This is the adoption of the "make whole" technique. In Wisconsin, the Commission has upon a showing of no substantial change of conditions other than subsequent increase in certain costs or expenses closely following a full rate case adopted the "make whole" procedure and cut the lag to a considerable extent.

Stabilization Funds

IT HAS BEEN suggested that the creation of a stabilization fund would go a long way in removing inequitable burdens cast upon either the public or the utility occasioned by the regulatory lag. A stabilization fund is one that would be credited with excess earnings and charged with the deficiencies in earnings measured by the differences between a determined reasonable rate of return and actual return over a given period.

A variation of this plan would provide for a capitalization of the deficiencies suffered by the utility between the filing of the petition and the effective date of the order followed by an amortization of this deferred account, say, over a period of 5 years.

There may be some merit in these suggestions. But there are some objections too. They may prove to be money "burning a hole in the pockets" of both labor and management.

In the case of the stabilization fund, an adequate safeguard could be provided against its dissipation by the control of the payment of dividends; but what practical restraints can be placed upon allegedly improvident expenditures for either salaries, wages, other expense items or even capital improvements, which, but for the presence of a surplus in the fund would not be made? The covetous eyes of both management and labor towards this fund may lead to abuses, or the suspicion of abuses, which would provide a strong impetus for transporting commissions beyond the arena of regulation and well into the fields of management.

Such a fund would also require the establishment of standards such as an agreed rate base, rate of return, materials and supplies, working capital and definite dates for periodic reviews beforehand.

With respect to both a stabilization or capitalization of deficiency funds, some limitation would have to be placed upon earnings to avoid the sandbagging effect of the federal excess profit taxes upon service rates. Just a casual survey of the effects of excess profit taxes would quickly demonstrate the disproportionate service rates which would have to be charged to realize even a small accumulation of net return available for such funds.

In addition to these objections, some provision would have to be made to make such funds work both ways before it would become palatable to most commissions or state legislatures where legislation may be required. Nonetheless, these ideas upon further study and exploration may hold promise of some solution of the present haphazard manner of counterbalancing the respective equities of the public and public utilities because of the regulatory lag.

Adequate Service

FREQUENTLY commissions are importuned to deny applications for rate increases not because the customer is opposed to a reasonable increase as such but because he sincerely believes the service is not worth it. He uses the forum of a rate proceeding to voice his complaints and urges municipal attorneys to contest any increase however reasonable until "the service is worth it." In the interest of orderly procedure and because service matters are more or less of a continual problem, commissions have considered service complaints separate from rate matters. Nonetheless, opposition and delays in the prompt dispatch of rate cases occasioned by service complaints could be eliminated to a great extent if the utilities would dispose of those service complaints which are well within their ability so to do before making an application for a rate increase.

Granted that some service remedies depend upon the raising of additional capital, it is a misconception of the regulatory process to presume that the public should provide earnings upon improvements not yet made. It violates the "used or useful" property concept upon which earnings are authorized according to the majority of regulatory laws. A stubborn attitude on the part of utilities to refuse to make service improvements or to comply with service standards until after they have received rate increases contributes to a large degree to the very delays about which they complain. Utility management should not delude itself into thinking that commissions cannot detect the difference between inability to satisfy service requirements and unwillingness to do so. Commissions, being human beings, react accordingly and utility managements may well appraise this factor in their complaints about regulatory delays. It is much easier for a commissioner to be sympathetic to the rate requirements of a utility which has few or no service complaints as against those which are continuously being prodded to do that which they should have done in the first place. Good public relations and, hence, expedition in rate cases are almost always present with those utilities which have a good service record.

Emergency or Interim Rate Increases

IN WISCONSIN statutory authority permits the Commission in the case of an emergency or when necessary to prevent injury to the business or interests of the people or any public utility to alter existing rates. Perhaps the biggest obstacle to receiving this type of rate relief lies in the various conceptions as to what constitutes an emergency.

Although emergencies seem to be the order of the day upon a national scale, it is doubtful that the legislature contemplated precisely the same thing. If so, most every utility could make a showing for emergency relief in any rate case. The utilities would then be right back where they started from—that is, standing in an "emergency line" with just as long a wait as a "permanent increase queue". An interim order contemplates another final order after a full investigation. Frequently this results in an adjustment of the interim order. Hence, there would be in ef-

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NEW CONSTRUCTION METHODS

By RICHARD ALLEN

"New methods and new tools have played an important part in holding costs down and in helping the industry meet its service objective." (Concluded from the Sept. Telephone Engineer & Management).

FORMERLY, it was the practice to place an inside protector in a sheltered location such as under a porch ceiling when an interior location was found to be impracticable as indicated in *Figure* 9. This method is now obsolete. Instead, an outside protector, of the type illustrated in *Figures* 10 and 11, or an inside protector in a protector mounting (*Figures* 12 and 14) is attached to the house siding, generally about 5 feet above the grade line, a higher position being selected if needed as shown in *Figure* 15.

An outside location for the station protector is recommended for the following types and locations of residences:

(1) Town residences without basement or connected garage.
(2) Town residences with finished basement (having entire basement ceiling covered or having a basement apartment with utility room not suitably located for drop entrance).
(3) Town residences with half basement (ventilated space under floor).
(4) Farm residences with or without basement.
(5) Town residences with or without basement in exchanges where the central office is unattended.

It is desirable to install outside protectors at farm residences (or town residences in exchanges with unattended central office) to minimize the possibility of repairmen having to make long trips on a trouble case only to find the subscriber not at home. The trouble rarely is in the station equipment beyond the protector, so if the protector is located outside the house to be accessible to the repairman, he will seldom be compelled to return at another time if he is called out and finds no one home after driving a long distance.

Experience with various types of building construction indicates that it is desirable to run the interior wire into the building from the protector through a hole into the wall space, just under the protector, rather than run the wire exposed to an entrance through the sill. In some cases, however, it is not practicable to enter through the wall space as when the house has no basement and the telephone instrument is located in another part of the house remote from the location of the protector. The wire then has to be run up into the attic space, entering through the roof eaves as shown in *Figures* 16 and 17.

Bridle wire ordinarily is employed for the wire run from the outside protector to the instrument. It is, however, more convenient to use the regular inside wire, especially in short runs, and protect the wire with plastic tubing (type E or type L guard). The type E guard is extremely flexible and is very satisfactory for long runs as in *Figures* 17 and 18. The type L guard which is smaller and less flexible can be used only in short lengths, generally not exceeding 2 feet. (The L guard is adapted from its intended use for protecting open wires in wire leads.)

The ground wire is run to a ground rod set in the soil under the protector, about one foot from the foundation wall and with the top of the rod 3 inches below the surface of the ground. A narrow, shallow trench is dug for sinking the rod below the ground level and burying the ground wire and tail. If the soil composition permits, the rod is "pumped" into the ground, water being used to soften the soil for this operation; otherwise the rod will have to be driven into the soil. The ground wire is then spliced to the tail of the rod with a compression sleeve (064 x 104 reduction type).

The method of installing an outside type protector on a village residence is illustrated in *Figure* 19. The completed installation is shown in *Figure* 20.

Proper Care of Wire Rope Will Prolong Its Life

CONSTRUCTION crews make much use of winch lines in pole erection and removal, pulling up line wires and guys, taking out anchors, and other related work. The wire rope used in the winch lines is very perishable and is very expensive if it has to be replaced frequently because of improper use and care. The following precautions are suggested to prolong the life of wire rope:

When handling wire rope do not kink it or it may be ruined. If it is to be uncoiled from a reel, mount the reel on a horizontal shaft. When it is in a coil do not attempt to pull it out from the coil, but uncoil it by rolling the coil along the ground like a hoop.

After a new rope is placed on the winch drum reel it out and in without load to let it adjust itself. It may be necessary to disconnect the socket on the end of the rope to permit it to turn and eliminate the initial twist.

Keep spare ropes on hand to avoid delay in making replacements. Store them in a dry place and at least twice each year lubricate them with light oil to prevent surface corrosion and drying out of core.

Watch sheaves and drums for wear and damage. Rough sheave grooves will shorten rope life. Grooves that are too wide will flatten the rope, and grooves that are too narrow will pinch.

Don't wait for the rope to fail before replacing it, as serious damage may result. Inspect all ropes frequently, and replace any that have worn spots or an excessive number of broken strands.

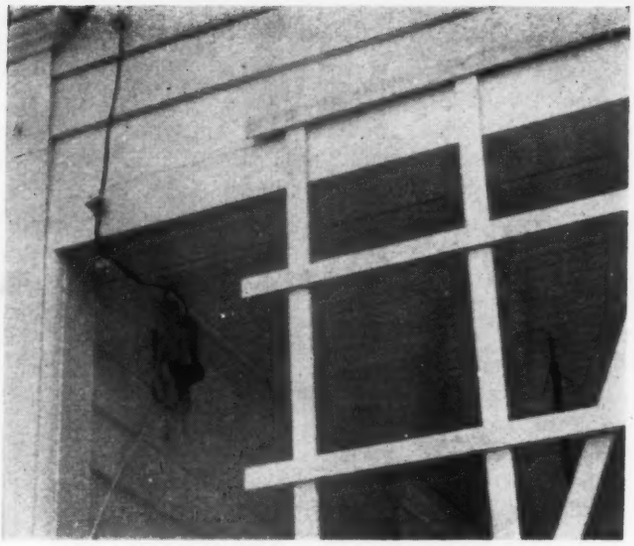

Fig. 9—Wrong type of protector in improper location. This inside type protector should be installed in the basement or contained in a protector mounting (Figure 13) installed on the rear or side of the house, not on the front porch.

Adjustable Climbers Are Coming Into Use

WITHOUT his climbing equipment, particularly climbers, a lineman would be virtually helpless to carry out work assignments that require him to climb poles. The climbers, like shoes, must fit properly or the user is likely to suffer from chafed ankles and legs. Hence, these tools are selected with great care and are carefully adjusted by bending, if necessary, to obtain a comfortable fit for the wearer. The associated leg and ankle straps and pads are also carefully selected for good fit.

The most important factor in proper fit of climbers is the correct length of the shank or "leg iron" as it is better known. When a climber is selected for a new man, the distance from the shoe arch to the projecting knee bone of the leg is measured, and one-half inch is subtracted from this measurement. Standard climber lengths vary from 15 inches to 18 inches in steps of one-half inch. This

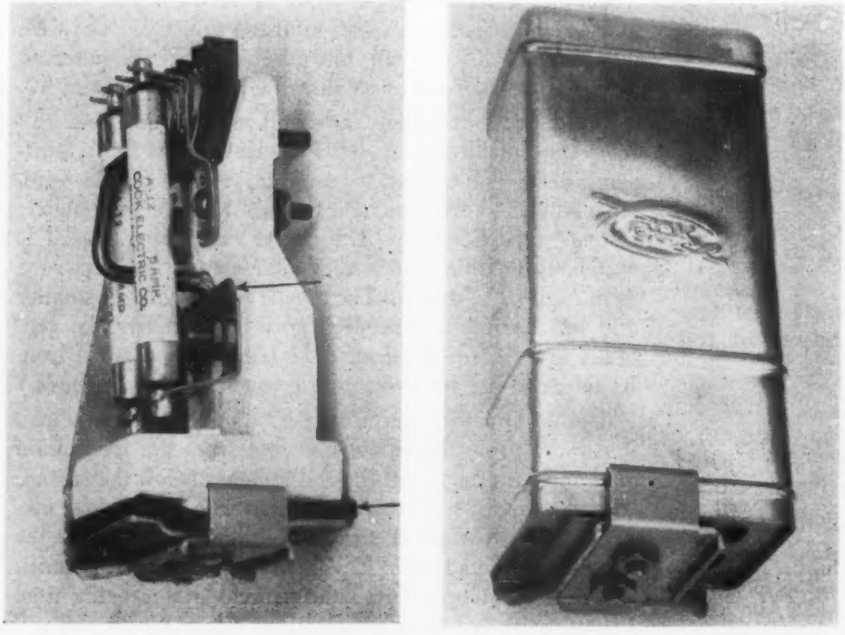

Fig. 10—Cook Electric Type "0-12" outside protector. Left—Without cover, showing Tru-Gap discharger blocks and 5-ampere fuses. Note secondary surge discharger (upper arrow) designed to operate when fuses blow on a power cross, also to operate on heavy discharges. Bottom arrow indicates neoprene gasket for insulating drop and bridle wire from the metal base and preventing entrance of dust, insects, and moisture. Right—With cover in place, showing positive locking device intended to hold cover in place in case of a heavy discharge and to prevent tampering.

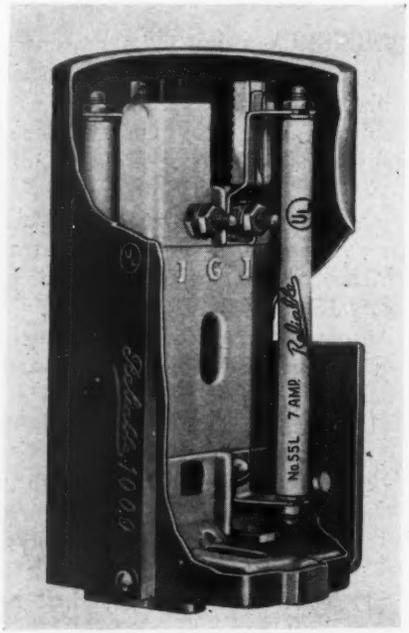

Fig. 11—Reliable Electric Type 1000 outside protector. This protector is equipped with self-cleaning "saw-tooth" discharge blocks with carbon blocks and 7-ampere ceramic fuses (other types of fuses available). The cover has a slot in the bottom edge so it can be locked in position with the screw shown.

calls for stocking of seven different lengths of climbers.

The need for stocking these different lengths of climbers to accommodate different users can be eliminated by providing adjustable type climbers such as those illustrated in *Figures* 21 to 25. These climbers can be first adjusted for proper length and then bent to fit the leg contour of the user for maximum wearing comfort.

Climbers are provided with straps of 22-inch and 26-inch lengths for calf and ankle. The longer length is intended for use when the worker is wearing heavy clothing or overshoes. Another type of strap is available in two-piece style for use on climbers equipped with rings. The two different styles of straps are illustrated in *Figures* 24 and 26.

For really comfortable wear, climbers pads are essential. These may be plain or felt or sheepskin lined according to the preference of the user.

As indicated in *Figures* 22 and 24, some types of climbers have detachable gaffs which enables worn out gaffs to be replaced without the need for discarding the entire set of climbers. This is considered a great convenience by many users.

The elimination of telephone line noise caused by trees contacting the telephone wires as well as

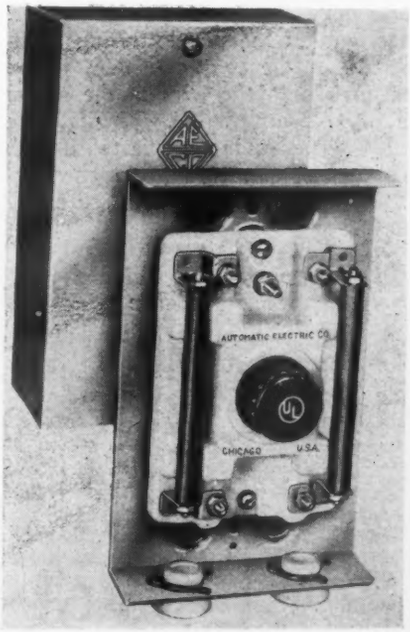

Fig. 12—Automatic Electric Company Type 20 inside protector in protector mounting for outside installations. Protector blocks are standard grounding or non-grounded porcelain and carbon insert type with opposite plain carbon blocks. Fuses are of telephone or power ampereage ratings specified by the telephone company. The protector mounting is provided with separate porcelain bushings for the drop and bridle wires. The cover locks in place with screws.

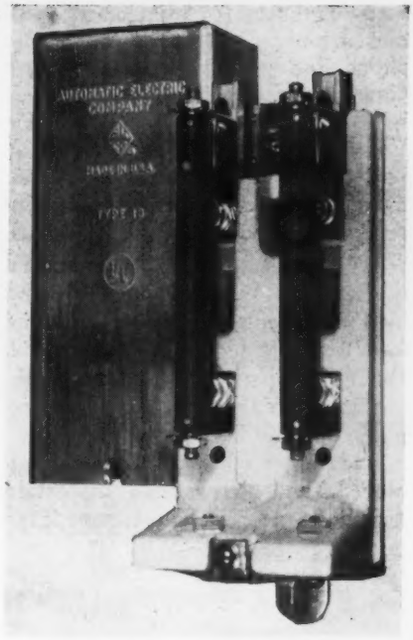

Fig. 13—Automatic Electric Company Type 15 Substation protector designed for outdoor installations.

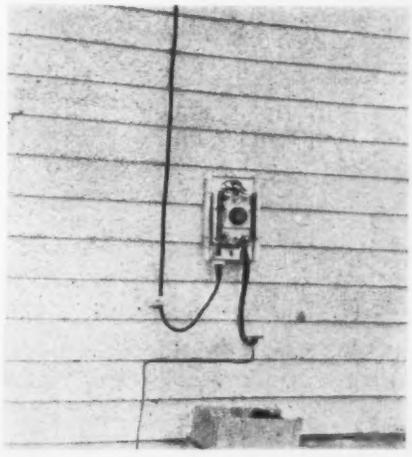

Fig. 14—Inside protector in protector mounting on side of house. Note use of friction tape to protect inside wire run from protector to entrance into house.

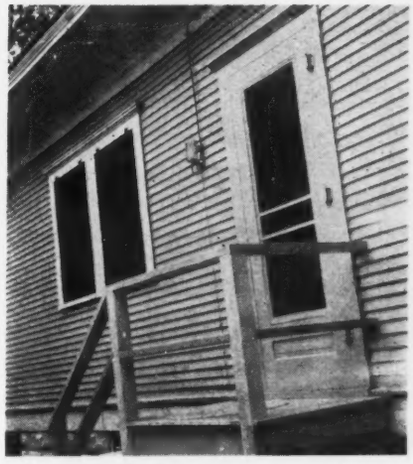

Fig. 15—Location for outside protector at higher than normal level to clear persons using porch steps.

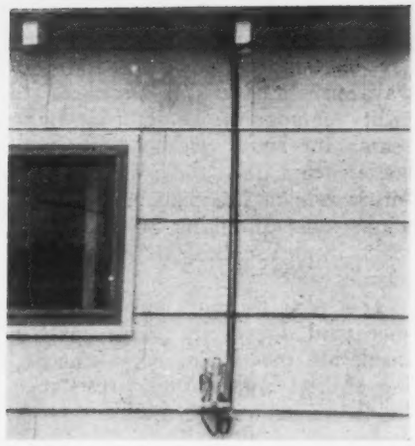

Fig. 16—Outside type protector with inside wire run into attic protected by plastic guard between protector and entrance.

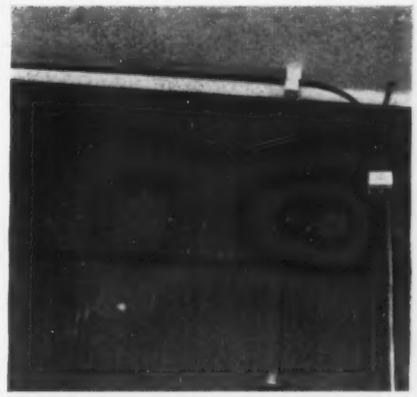

Fig. 17—Close up view of inside wire run from protector to entrance into attic space encused in Type "E" plastic guard. Note that the protected inside wire is run in the same "C" knobs with the drop wire.

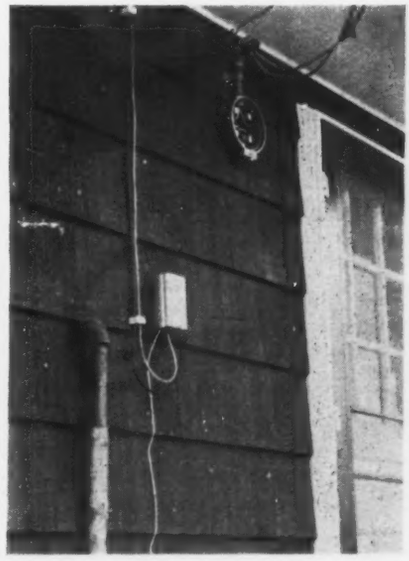

Fig. 18—Outside protector on a prefabricated type of house (without basement), using type "E" plastic guard in wire run between protector and entrance into attic space. (See Figure 17).

the elimination of electric service interruptions caused by trees contacting electric service wires have always presented major problems to utility companies. In its continuing search for better overhead line protection from trees, the Southern California Edison Company has adopted a new type of tubing or line jacket made from Vinylite extrudable rigid plastics.

This plastic tubing has been most successful due to its good electrical insulation properties, good weathering ability, high abrasion-resistance, lightness in weight, high strength, and economical application methods.

The tubing is marketed under the trade name, "Martex", by the Calmar Corporation, and is produced in 20 foot lengths in two diameters, 9/32 inches inner diameter for bare telephone line wires and ½ inch inner diameter suitable for drop wires. It is cut lengthwise in a spiral (one spiral every two feet) so that the line jacket may be slipped over existing or new wires without cutting the wire or pulling the jacket long distances.

Five thousand feet of this special tubing were installed in 1943, and by 1950, over one hundred thousand feet were being installed annually. During this period of time the Southern California Edison Company reports that no failures have ever occurred where this tubing was employed, and that casual inspection has shown no appreciable wear, even under close and frequent abrasive contact with tree branches.

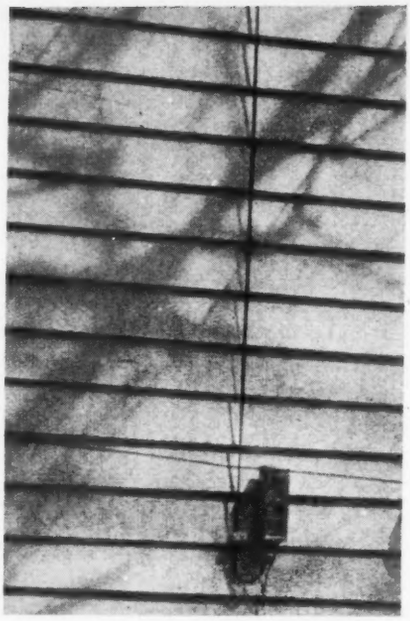

Fig. 20—Showing completed protector installation described in Figure 19. Note use of direct vertical run of drop from first attachement of drop span to building. This is an important factor in securing a neat installation.

Fig. 19—Steps in installing outside type protector: 1—Boring entrance hole into wall space. 2—Attaching protector bracket. 3—Protector mounted on bracket. Bridle wire has been fished through wall space into basement. 4—Taping bridle wire to plug entrance hole. Wire has been connected to proper terminals of protector. 5—Fastening ground wire to house siding with wire staples. 6—"Pumping" ground rod into soil for connecting ground wire. 7—Attaching drop wire in "C" knob at protector. 8—Connecting the drop wire to protector line terminals as a final step of the protector installation.

The economical application of this material is easily controlled by a simple hand tool. This tool is utilized to partially open the spiral cut in the rigid plastic tubing as it is forced over the wires for protective purposes. The end of the plastic tubing is inserted in the tool and then pulled through onto the wire at the actual point of installation. Finally, the ends of the tubing are fastened with an asphalt saturated tape. The procedure is illustrated in *Figures* 27 to 30.

New Type of Five-Pair Self-Supporting Cable

A NEW TYPE of five-pair self-supporting cable has been devel-

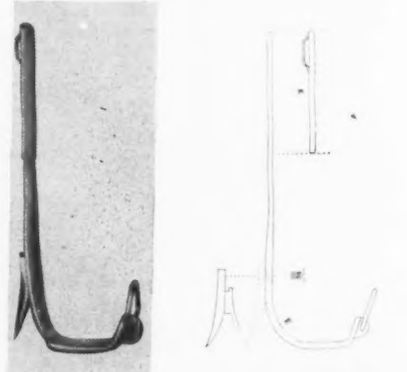

Fig. 21—(left) Bashlin's adjutsable climbers. . . . Fig 22—(right) Component parts of the Bashlin climbers showing the adjustable sleeve and the removable gaff. The sleeve is adjustable in steps of 1/4 inch.

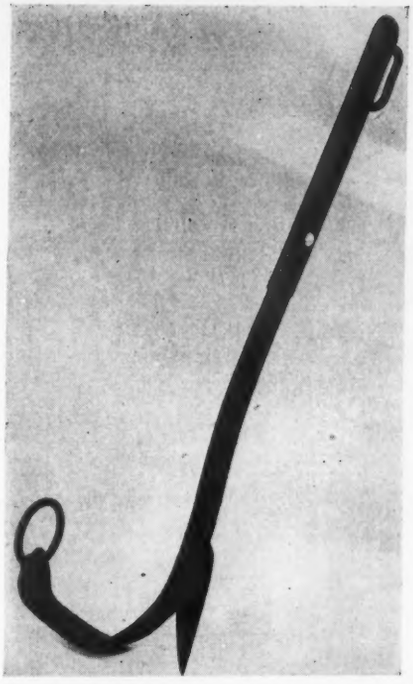

Fig. 23—The Buckingham adjustable climber with leg iron preformed for correct fit on users's leg.

oped by Michigan Bell Telephone Company engineers as a substitute for open wires in situations where clearance requirements or other factors prevent placing additional open-wire circuits on existing pole leads. This cable can also be used in p'ace of multiple drop wire runs to small apartment houses and business concerns.

The cable is made up of five pairs of insulated wires wrapped

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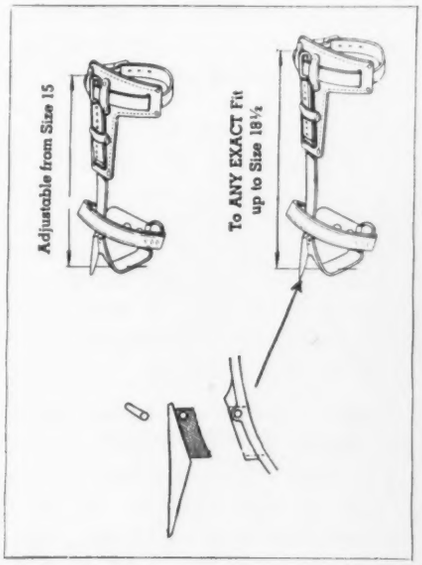

Fig. 24—Showing maximum and minimum leg iron lengths of Buckingham adjustable climber. Note foot and calf straps and climber pads designed for wearing comfort, also removable gaff.

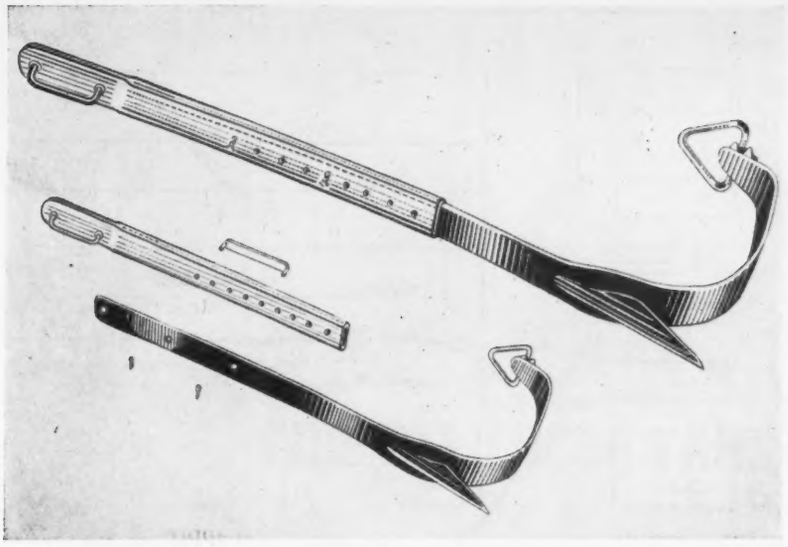

Fig. 25—The Klein adjustable climber, illustrating the method of assembling the sleeve on the leg iron.

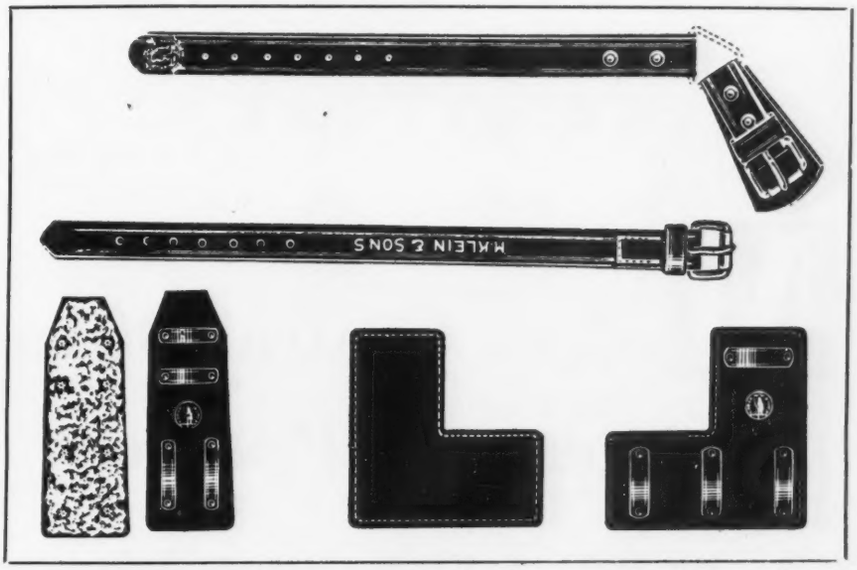

Fig. 26—Kleins climber straps and pads. Upper—standard 22- or 26-inch Nylon straps. Center—Two-piece straps for ring type climbers. Lower left—Angle shaped climber pads. Lower right—Long type climber pads.

Fig. 27—Inserting the hand tool into the spiral cut in the Vinylite rigid plastic extruded tubing, the lineman is ready to pull the tubing onto the wire at the actual point of installation.

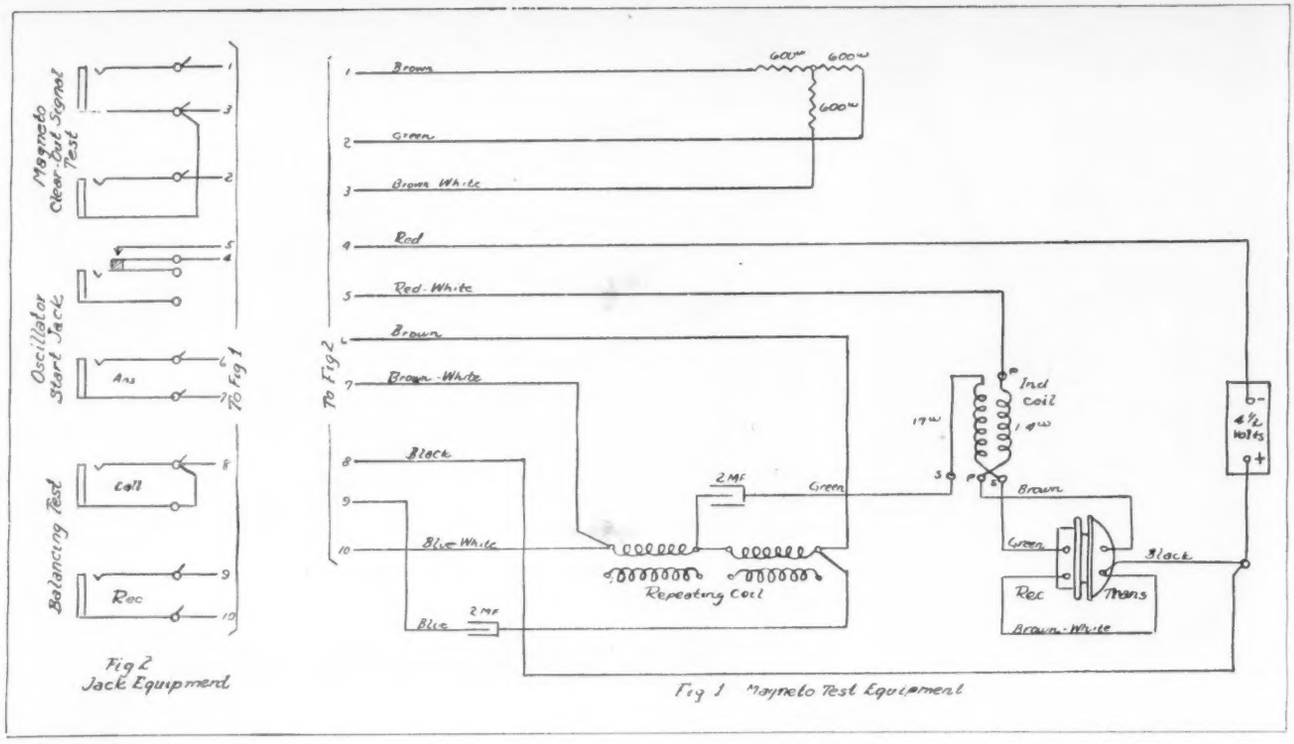

Fig. 185—Wiring diagram of same unit shown in Figure 184.

Modern Central Office Maintenance Practices

By JOHN S. REED, Lincoln, Neb.

Section XII-B of Mr. Reed's article begins a discussion of — (1) Interpreting Circuit Diagrams; (2) Principles of Circuit Diagram Reading, and (3) Line Finder Operation.

THE apprentice should also learn the meaning of the symbols appearing on the circuit drawings. A list of most commonly used symbols appears in *Table* 2. It should be noted that, while many of the symbols listed are standard, there are variations among different manufacturers and even in different prints issued by the same manufacturer. These differences should be allowed for in studying the circuit drawings.

At this time, the beginner should learn the standard color code used for identifying pairs in switchboard cable connecting the distributing frames to manual switchboard jacks or to automatic line equipment or connector terminals as well as switch groups. Table 3 shows a list of standard code colors by number sequence. A study of this list shows that five basic colors are employed for the color conductor and three for the mate. Knowing the color code order always employed, namely, blue, orange, green, brown, slate, then blue-white, blue-orange, etc., it is possible to identify the particular terminals a pair connects to by noting the color combination used. This method will minimize errors in making connections and tracing equipment trouble.

When using a circuit diagram in tracing trouble, it will sometimes be found that certain connections are not made according to the diagram. The experienced switchman or switchboardman does not accept this variation as a cause for concern, but checks further to see if the same path still is followed for the circuit operation. For example, a relay terminal may be connected to a terminal on a terminal strip and then to another relay terminal on the circuit print. In the equipment, the connection actually runs from one relay terminal to the terminal of the other relay and then to the terminal on the terminal strip. It is obvious that this arrangement does not affect the relay current flow and hence no further attention is paid to this connection.

Typical Procedure In Learning to Read Circuit Diagrams

IN THE CASE of a central office using, for example, Automatic Electric step-by-step switching equipment, the apprentice should be started with the line finder equipment and then progress to the selector and connector switch equipment in that order. The learner uses the

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circuit diagram and circuit explanation sheets furnished by the manufacturer. First he studies the features of the finder switch, and then goes on to the circuit operation of the various parts of the switch. He should have the assistance of his supervisor in tracing the circuits of the switch.

The following is an example of the circuit explanation procedure extracted from material furnished through the courtesy of the Automatic Electric Company.

Illustration references in the circuit explanation are to circuits in the line finder and associated equipment which are actually grouped on one circuit drawing.

Explanation of Line Finder Operation —Originating a Call

SEIZURE: When the calling subscriber closes the loop, the circuit is closed to the line relay (*Figure* 187) of this line. *Line relay L operates*, grounds the CN-lead to the connector banks (marking the line busy on the connector banks), grounds the vertical bank contact corresponding to the level associated with the calling line, and connects the CO-relay to the C-contact of the finder banks to mark the position of the calling line on the regular bank.

START SIGNAL CIRCUIT: The start lead of each line circuit is connected to one of the 10 start and level marking leads shown in the start and level marking circuit in *Figure* 188. Each start lead is common to 20 lines as follows:

Lines 11 to 10 and 111 to 110 are connected to start lead 1.
Lines 21 to 20 and 121 to 120 are connected to start lead 2.
etc. to
Lines 91 to 90 and 191 to 190 are connected to start lead 9.
Lines 01 to 00 and 101 to 100 are connected to start lead 10.

Each group of 20 lines connected to the same start lead is connected to one level of the finders (the lower numbered 10 to the lower line bank and the other 10 to the upper line bank; the C-leads of all 20 lines are connected to one level of the C-banks)

Each start lead terminates directly on the vertical bank contact of the level to which the associated 20 line circuits are connected. This connection of the start lead serves to mark the calling level and to stop the vertical motion of the finder. Due to the reversal of the bank wiring between line finder groups A and B, the connection of the start leads is also reversed between the two groups so that the 10 start leads are connected to the following vertical banks:

Start lead 1 to level 1 of finders in group A.
Start lead 2 to level 2 of finders in group A and level 9 of group B.
Start lead 3 to level 3 of finders in group A and level 8 of group B.
etc. to
Start lead 9 to level 9 of finders in group A and level 2 of group B.
Start lead 0 to level 1 of group B.

Vertical bank contact 10 is permanently grounded in both groups. Each start lead also terminates on a 2,000 ohm resistor. The five resistors for start leads 1-5 are commoned and form the start lead A which is normally connected to relay C of the group relays A. The other five resistors (for start leads 6-10) are also commoned and form the start lead B which is normally connected to relay C of group relays B. This division of the 10 start leads from the line circuits into common start leads A and B determines the control of a call by either group relays A or B.

In the following explanation, group A will be considered entirely: the operation of group B being exactly the same.

In order to facilitate explaining the operation of this circuit, the relays of figure 5 are numbered with the number of the figure, for example, relay B is called relay B-5. The relays in the group relay circuit are referred to by their letter only. It will be assumed that Fig. 5A is used in explaining section one of this explanation.

Relay B is normally energized by ground received from the free line finders associated with the finder

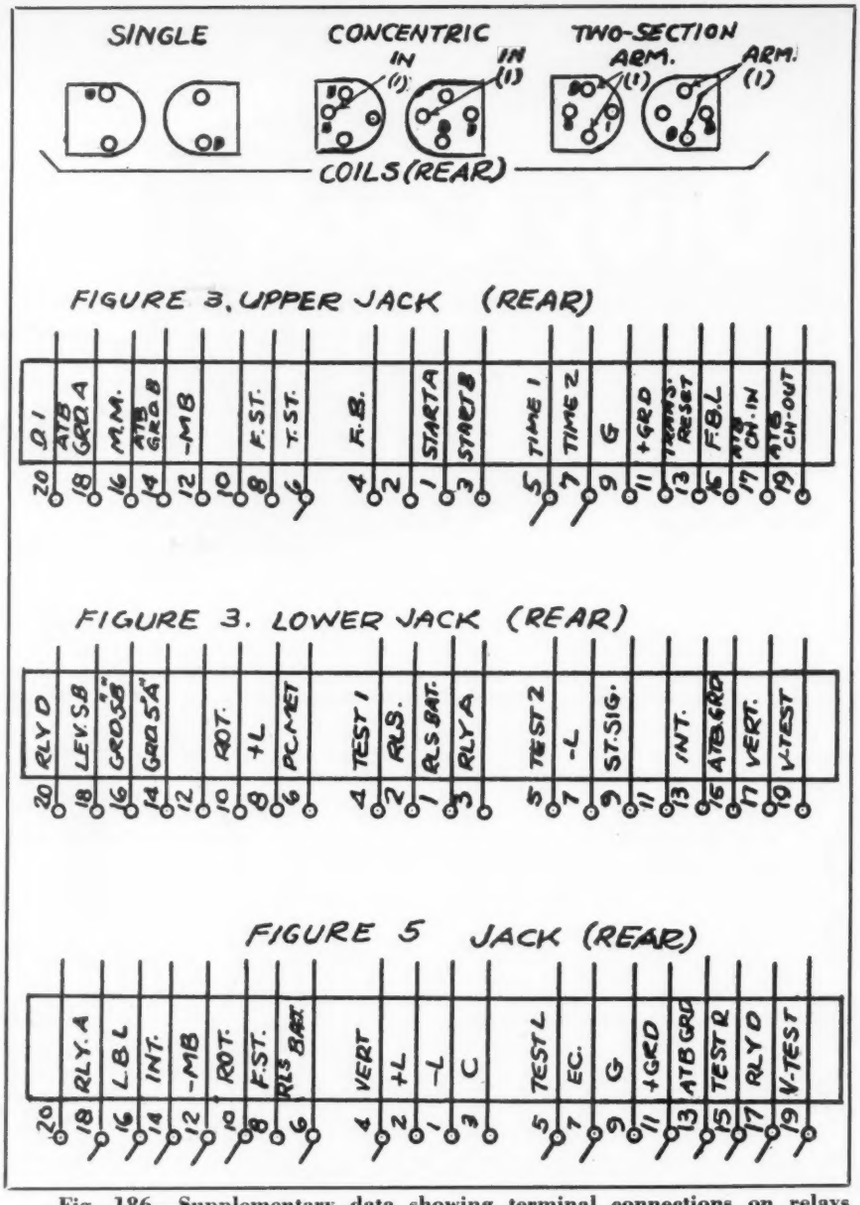

Fig. 186—Supplementary data showing terminal connections on relays and jacks of line finder and associated equipment.

group. The distributor switch is normally connected to an idle finder.

Ground received over a START lead closes the circuit to relay C. *Relay C operates,* closes the circuit to relay F, and closes the circuit to relay N (in series with magnet MM of the distributor switch). *Relay N operates* (but not the motor magnet MM), grounds the F. St. lead (completing a circuit to relay B-5 of a pre-selected idle finder), connects a multiple ground to relay B, closes a pre-energizing circuit to the #2 windings of relays K and J, and extends relay A to the Int. lead. *Relay F operates*: Closes a locking circuit to relay N, grounds the TST lead and prepares vertical and rotary test circuits by grounding the TEST-1 and TEST-2 leads.

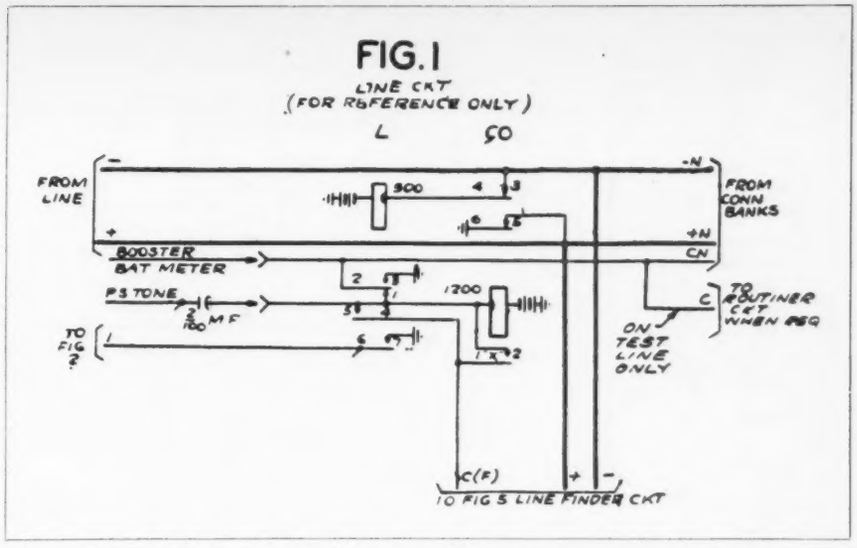

Fig. 187—Typical circuit diagram showing line circuit associated with line finder circuit.

Relay F also grounds a lead connected to jack 14L. This lead terminates on jack 16L of the group relays B. As long as there are idle finders in both groups, the ground from relay F is extended to vertical bank contact 6 of group B and from there to vertical bank contact 5 of group A. This ground prevents a finder from moving higher than the fifth level as long as there are idle finders in both groups. A corresponding circuit exists between group relays B and the fifth vertical bank contact of group B.

Relay *B-5 operates* in the finder: Closes the circuit to the #2 winding of relay A, normally closes the #2 winding of D-5 across the "—" and "+" leads to pre-energize the A relay of the first selector, connects ground to the C wipers through relays K and J, connects the vertical bank's wiper to battery thru the #2 winding of relay M and prepares the circuits to the vertical and rotary magnets. *Relay A operates* and closes the circuit to the VERT magnet.

VERTICAL MOVEMENT: (Operated: Line relay L and relays A,B,C,F,N and B-5). The VERT magnet of the finder operates and elevates the shaft and the wipers one step. The finder vertical off-normal springs (VON) operate on the first step. The *VERT. INT. springs operate* and open the circuit to relay A, which restores and opens the circuit to the VERT magnet. When the *VERT magnet restores,* it closes the VERT. INT. springs; this in turn operates relay A. The *VERT magnet operates* again; this action continues until the vertical wiper reaches the VERT BANK level marked by ground from the line circuit over a start lead. This closes the circuit to the #2 winding of relay M. *Relay M operates,* closes its own locking circuit to its #1 winding in series with the #2 winding of relay P, and opens the circuit to the VERT magnet. *The VERT magnet restores* and closes the circuit to relay A. *Relay P operates,* closes its locking circuit to the #1 winding over the "X" contacts, opens the circuits to both windings of relay M, switches the pulsing lead from the vertical to the rotary magnet, grounds the P.C. METER lead, opens the #2 winding of A, and closes #1A and #2A in series to alter the relay-interrupted rotary hunting speed. Relay M restores and closes the circuit to the ROT magnet.

Rotary Movement (Operated: Line relay L and relays A,B,C,F,N,P, and B-5 and VON springs). *The ROT magnet operates* and rotates the shaft and the wipers one step, *operating the ROT. INT. springs.*

The ROT magnet and relay A operate alternately in the same manner as in vertical stepping until one of the

Table No. 3—Color Code for Switchboard Cables

Pair No.	Color	Mate
1	Blue	White
2	Orange	White
3	Green	White
4	Brown	White
5	Slate	White
6	Blue-White	White
7	Blue-Orange	White
8	Blue-Green	White
9	Blue-Brown	White
10	Blue-Slate	White
11	Orange-White	White
12	Orange-Green	White
13	Orange-Brown	White
14	Orange-Slate	White
15	Green-White	White
16	Green-Brown	White
17	Green-Slate	White
18	Brown-White	White
19	Brown-Slate	White
20	Slate-White	White
21 to 40	Same as first 20 colors	Red
41 to 60	Same as first 20 colors	Black
61 to 80	Same as first 20 colors	Red-White
81 to 100	Same as first 20 colors	Black-White
101 to 120	Same as first 20 colors	Red-Black
121 to 140	Red plus first 20 colors in same order	Red
141 to 160	Red plus first 20 colors in same order	White

Note: Triples are formed in the same manner using one color wire with a white mate conductor and a red mate conductor, then one color wire with a red-white mate and a red-black mate conductor.

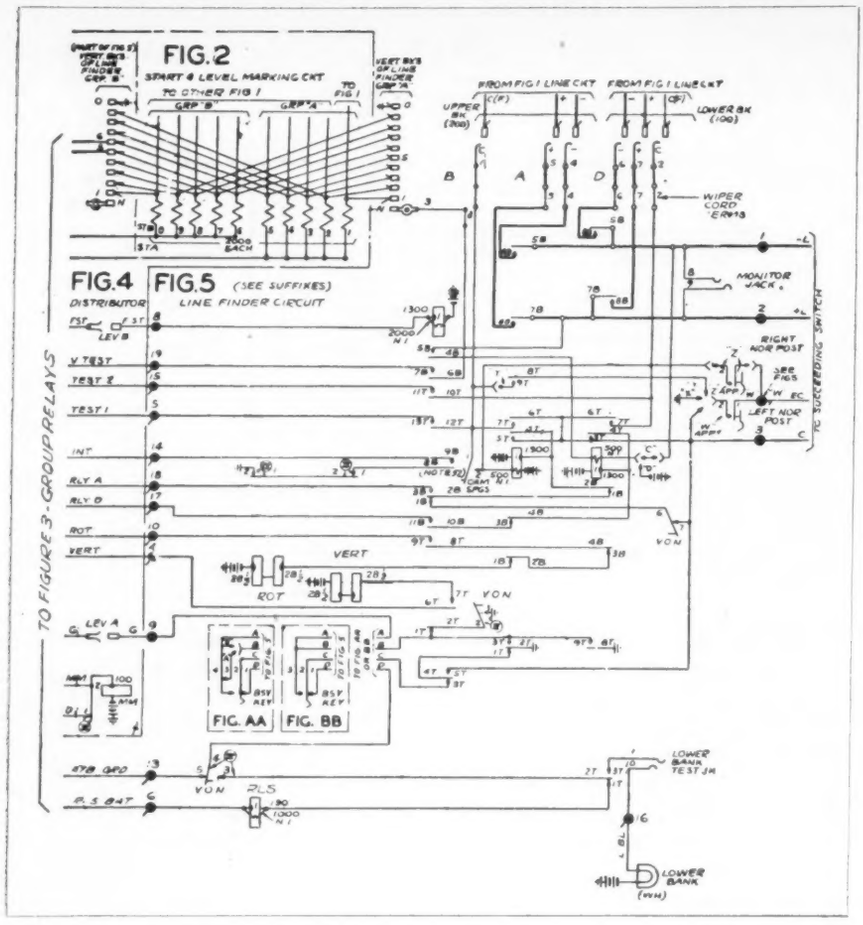

Fig. 188—Start and level marking circuit, distributor circuit, and line finder circuit.

"Modern Central Office Maintenance Practices"

Test Questions on Section XII—Interpreting Circuit Diagrams; Principles of Circuit Diagram Reading; Typical Procedure in Learning to Read Circuit Diagrams; Explanation of Line Finder Operation—Originating a Call.

(1) What is the common use for circuit diagrams? How are they valuable to the telephone engineer, the equipment installer, and the central office maintenance man?

(2) Explain the difference between a wiring diagram and a circuit diagram.

(3) What basic facts regarding current flow in a circuit will help in tracing the circuit on the diagram?

(4) State the rule in regard to flow of alternating current and direct current in a circuit containing an inductance. A capacitance.

(5) Draw the symbol representing wires crossing but not connected, and the symbol showing the wires connected.

(6) What is the symbol for a resistor? A switchboard lamp?

(7) Show a typical relay convention with a make spring combination.

(8) Recite the color code for the first 20 color conductors.

(9) What colors are used for the mate conductors of a pair.

(10) Trace the circuit of some central office apparatus that you are familiar with.

C wipers finds the bank contact corresponding to the subscriber's line which is marked by battery through the winding of the CO relay. Relay K (or J) will operate in series with the CO relay. Either relay, on operating, opens the circuit to the rotary magnet to prevent further stepping.

Extending Calling Line to Selector: If the subscriber's line is on the upper bank, *relay K operates*: Opens the circuit to the ROT magnet and closes the circuit to relay A-5. *The ROT magnet restores* and closes the circuit to relay A. *Relay A-5 operates*: Connects the "—", "+" and C leads from the selector to the "—", "+" and C leads of the calling line on the upper bank, and grounds the C lead.

If the subscriber's line is on the lower bank, *relay J operates*: Opens the circuit to the ROT magnet and closes the circuit to relay *D-5* which *operates*: Connects the "—", "+" and C leads from the selector to the "—", "+" and C leads of the calling line on the lower bank, and grounds the C lead.

In case two line relays are operated and on the same rotary position (such as 22 & 122) both C contacts of the same rotary position have battery connected. both *J and K relays will operate;* but relay K, in operating. will open circuit to relay D-5, and thus the upper bank contacts will have preference in switching.

The circuit to the A-5 and D-5 relays is closed through the contacts of relay A. The operation of relay A depends upon the restoring of the ROT INT springs; thus no switch through operation can take place until the rotary magnet in the finder has fully restored.

Should one of the C wipers pass over a contact at the moment positive booster battery is on that contact for operating a meter associated with that line and contact, the rectifiers RA and RB in series with the #1 winding of relays K and J offer high resistance to current of such direction so that neither relay could operate.

Ground on the C-lead from the selector is also extended to the C wiper connected to the bank contact of the calling line and closes the circuit to the relay CO at the same time as relay A-5 (or D-5) operates. Relay *CO operates*: Locks over the "X" contacts and opens the circuit to line relay L. Line relay *L restores*: Removes ground from the START lead and

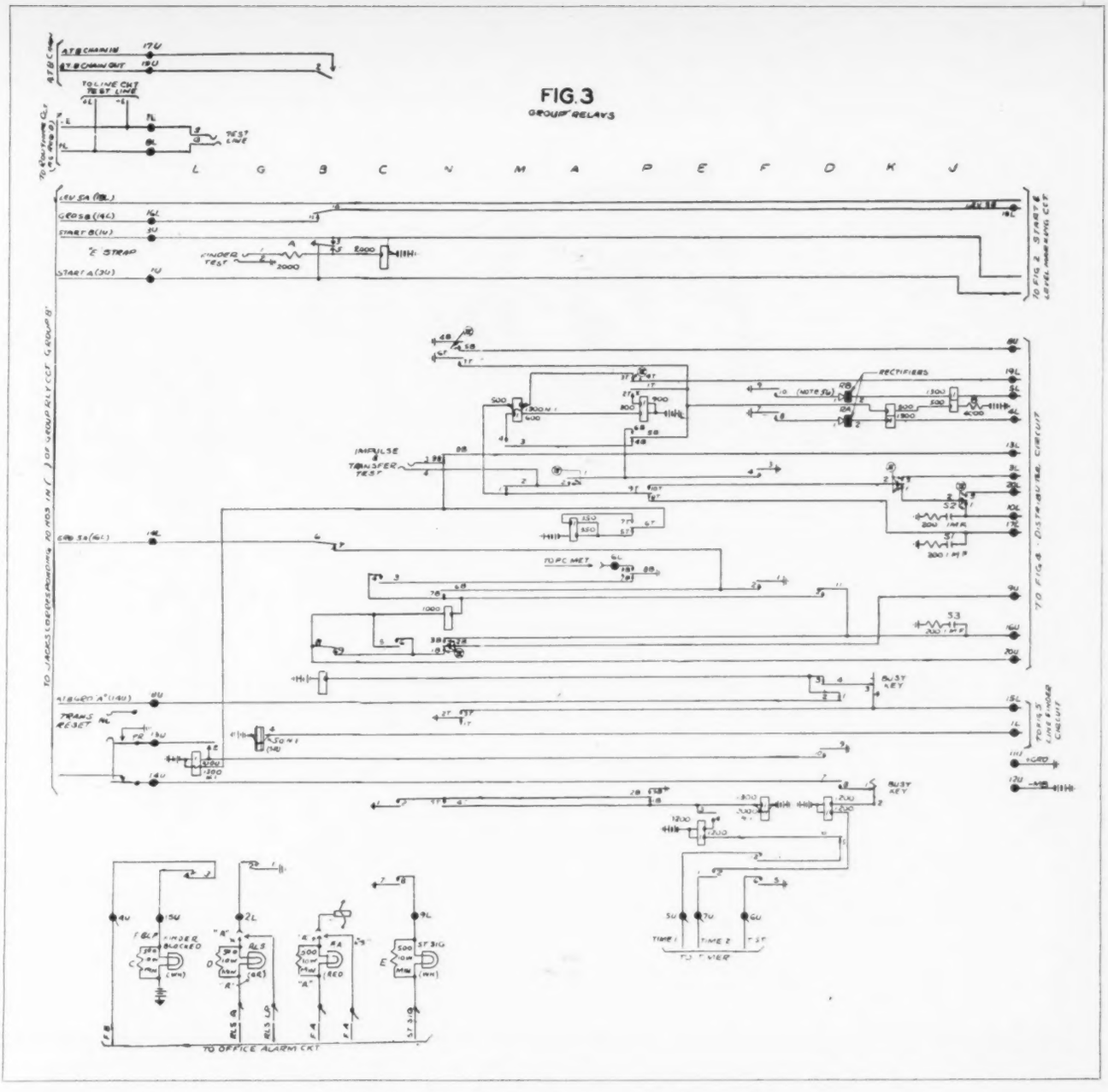

Fig. 189—Circuit of relay group for line finder.

connects the CN lead and the meter lead to the C lead.

The line loop is now connected to the succeeding selector and relays CO and A-5 (or D-5) are held operated by ground received over the C-lead from the selector associated with the linefinder. This same ground marks the CN lead to the connector banks and marks this line busy to all incoming calls.

The *RLS magnet restores.* Relay *G restores* and opens the circuit to the RLS-A (or RLS.LP.) lead.

Notes on Circuit Explanation: The S-1, S-2, and S-3 condenser and resistance combinations are intended to prevent excessive sparking at certain relay and motor magnet operating spring contacts. Relays are designed by letters at the top of the diagram and the relays and associated contact springs are lined up in columns under the letter headings. The designations "U" and "L" associated with jack spring contact numbers refer to upper and lower jack-in springs.

The foregoing example of a circuit explanation covers only the typical operation of relays, line finder switch, and associated distributor on subscriber calls. The description is somewhat involved and it is well to have the supervisor verbally explain the operation step by step as the apprentice follows the circuit for the particular function. To keep in mind which relays are operated and which ones are released in the circuit function, it is a good idea to employ colored pins to mark the relays. A red pin would be used for each operated relay and a yellow pin for each released relay in the circuit. After the circuit is traced from ground to battery, the pins are removed in the proper order to indicate the sequence of release.

The manufacturer's bulletins will be found very helpful when a detailed study of each circuit function is needed, as they contain simplified explanations and individual diagrams of each separate circuit of the apparatus. (*To Be Continued*)

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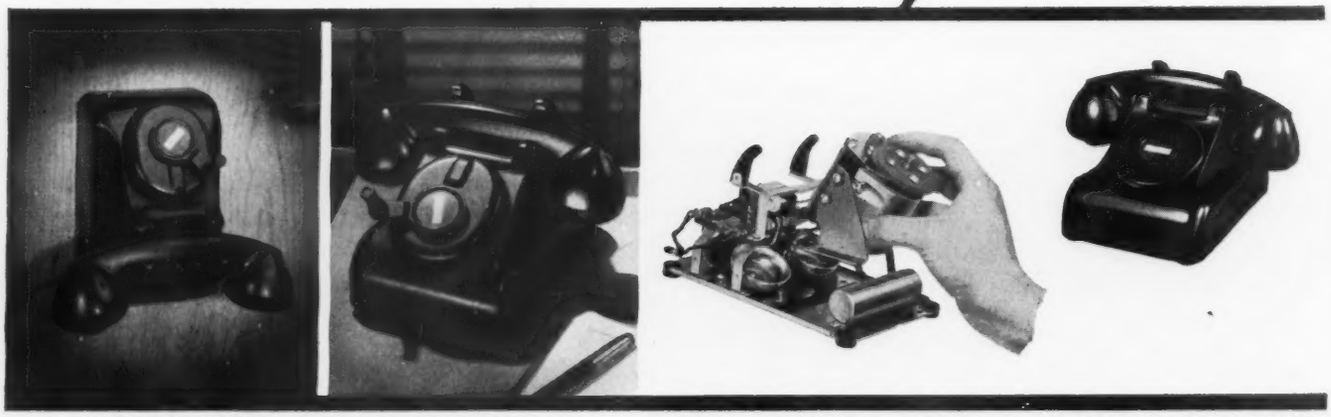

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MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

"How-To-Do-It" Suggestions

By JOHN G. REYNOLDS

Freakish Behavior Of Lightning

PROTECTION of telephone plant is ordinarily assumed to be a one-way proposition. In event of a lightning discharge striking a telephone line, the discharge is supposed to follow the wires to the nearest direct path to the ground, which is often the ground lead from the station protector. Sometimes the protector is literally blown to pieces by a direct lightning stroke, but the discharge will rarely continue beyond this point; provided that the ground connection is of low resistance.

On certain occasions, however, a lightning discharge will choose another path and enter the telephone line from the instrument end. The following case illustrates this freakish behavior of lightning. A lightning stroke hit a tree and jumped to adjacent power service leads going to a house. The stroke followed the house wiring to a floor lamp, exploded the light bulb, and jumped to the line cord of a telephone resting on a table by the lamp. The tinsel conductors vaporized and tore the cord in many places from about 18 inches from the telephone to the terminal block as indicated in *Figure* 1. The cover on the terminal block was blown to pieces. At the outside protector on the house, the protector blocks exploded into bits and the fuses blew, raising the cover on the protector about 2½ inches. The lightning stroke followed the drop wire approximately 100 feet to the first pole and continued for three spans (over 375 feet) to the protected cable terminal, blowing the line fuses there.

A boy who was reclining on a davenport less than two feet from the telephone cord was badly frightened, but unharmed, though the end of the pillow on which his head was resting was blackened by the lightning flash. The telephone instrument was not damaged.

The fact that the lightning stroke followed nearly 500 feet of drop wire to the cable terminal indicates that the station ground connection was probably sufficiently high in resistance to cause the discharge to take at least the major portion of the path to ground through the long run to the ground connection at the cable terminal.

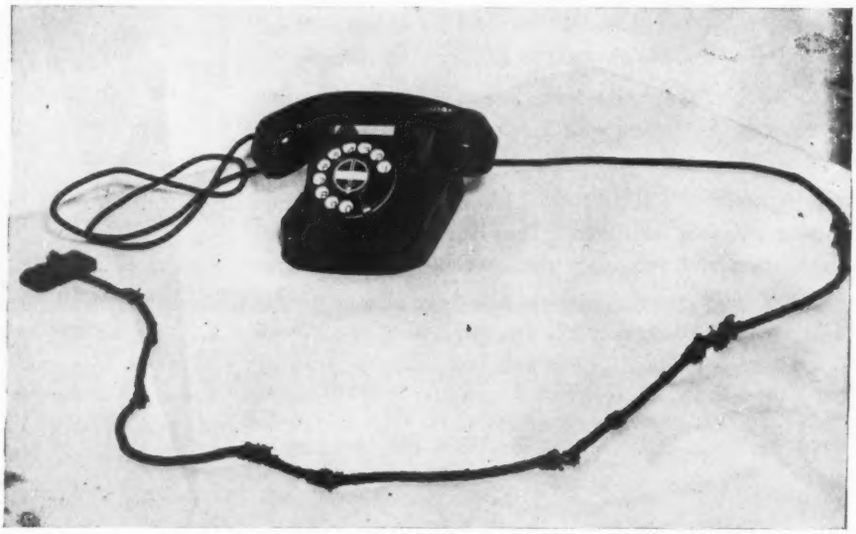


Fig. 1—Effect of lightning stroke jumping from floor lamp to line cord of telephone instrument.

Writing Figures:

WRITING figures should be simple, but a lot of time is wasted in telephone offices deciphering strange hieroglyphics. A few weeks ago one accounting department pointed out that if every employee would learn to draw figures, it would save time, insure accuracy, and keep friends. The department head stated that subscribers only demand two things: good service and an accurate bill. That accurate bill depends on traffic and accounting employees being able to "draw" a straight line, a curve, and a dot, and to read these drawings with camera speed.

Now accounting is training operators to "draw" so that a toll ticket can be read quickly and accurately.

According to the accounting artists, each number has its own fixed de-

sign. The figure one is simply a straight line "down"—no extras, and none of those wavy lines.

Number two is "around, down and over" without curliques and tails.

"Around and around" is a three.

"Down, over, down and cross the line" is a four.

It's all very plain: simple numbers easily read.

"Down, around, over" is a five.

A six is "down and around."

And seven is "over and down."

"Around and down, around and up" is the pretzel eight.

Nine is simply "around and down."

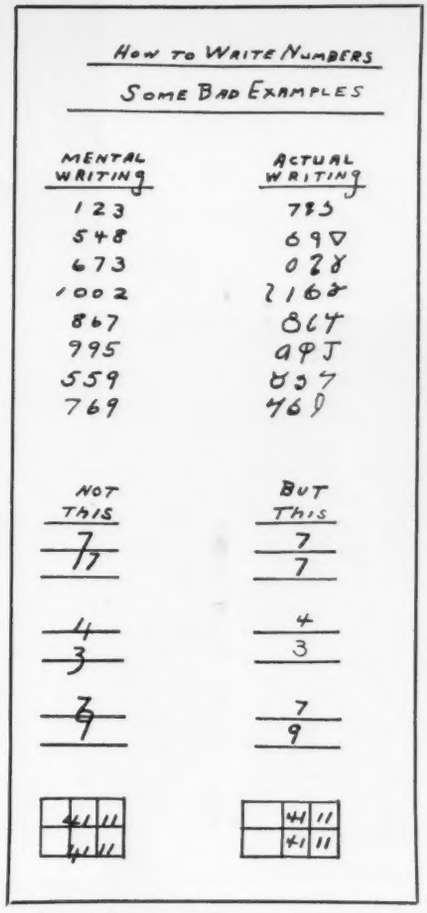
And ten is "down. And around."

The cipher is egg-shaped.

These are all fixed designs which everyone agrees on. There's no imaginative flair required—in fact, originality is frowned on!

But drawing classes never end with ability to put things on paper; spacing is also essential. The accountants warn that a perfect number in the wrong place can do much harm as an imperfect number. Never write on the line, only in the space between the lines.

The "drawing school" idea has much merit. After all, practically everything in the telephone business revolves about figures—service orders, register readings, toll tickets, bills to subscribers and pay checks.



Draw figures and save time and insure accuracy.

Good Telephone Usage

OPERATING companies will find that it pays dividends in good will to point out to their business subscribers ways in which their telephone service can be improved. For example, it should be explained to the subscribers that good telephone usage will improve the efficiency of store and office personnel who rely on the telephone to a considerable extent in their work, and will speed the flow of work in their organizations. Toll charges to business subscribers can be kept to a minimum by reducing circuit holding time through the efficient use of the telephones. In large business concerns, it is possible to hold operating personnel at P.B.X. switchboards to a reasonable minimum consistent with efficient handling of the calls when employees are properly trained in telephone usage.

The following instructions on good telephone usage are given to employees in the United States Government agencies who habitually utilize the telephone in their daily work:

(1) *Promptness.* In answering, pick up the receiver before the second ring. Answer the telephone personally. Return calls received during your absence as soon as possible.

(2) *Proper Identification.* When answering a call, avoid the inefficient "hello" or casual "yes." Identify either yourself or your office, or both. Identify yourself immediately when making a call. It is time saving and informative.

(3) *Completion of Calls.* Prevent call-backs by handling calls yourself if you can, even when they are not for you. Always transfer calls by giving the name and extension of the person who can give the desired information. Transferring calls merely to get rid of them helps no one—least of all the agency.

(4) *Telephone Attendance.* Leave word of your whereabouts when not at your desk. Important calls can then be transferred. Other callers can be advised of the approximate time of your return so that needless call-backs, tying up operators and equipment, will be eliminated.

(5) *Placing Calls By Number.* Help the operator by maintaining a handy reference of frequently called numbers. Placing local and toll calls by number speeds the service, saves time of the operators, uses less telephone service.

(6) *Courtesy.* In telephoning, the entire impression created depends upon the voice. Speak directly into

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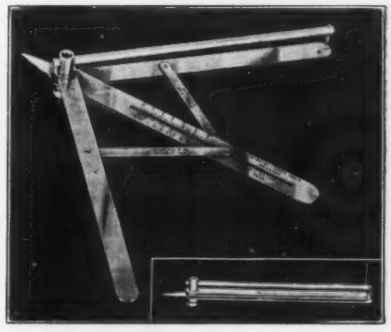
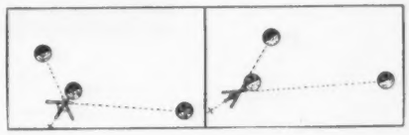


Shows Exactly Where To Place the Anchor

A loaded line that goes down in a storm costs hundreds of dollars, as we all know. But it makes you even sicker if you realize when you look at it, that part of the cause was faulty anchorage.



Be Sure of Location

One thing you can be sure of if you have a Dillon Bisector. That is that the anchor is properly placed. Why guess about this part of your engineering when you can get a Bisector for only $6.80? It's simple and fool proof to use, and you know for certain the anchor is in the right place. If it saves just one breakdown it pays for itself ten times over.

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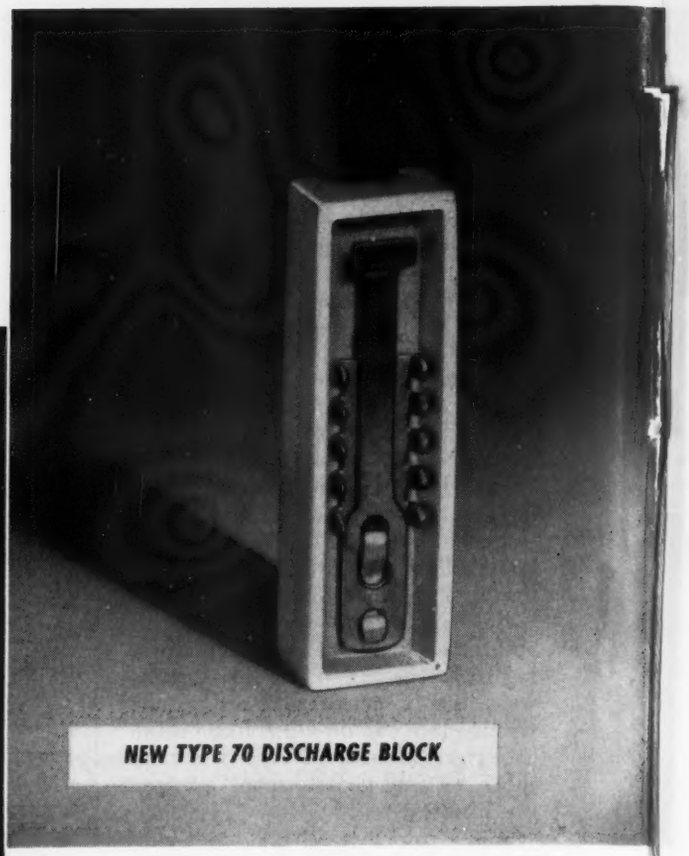
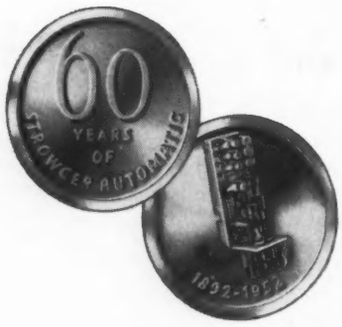
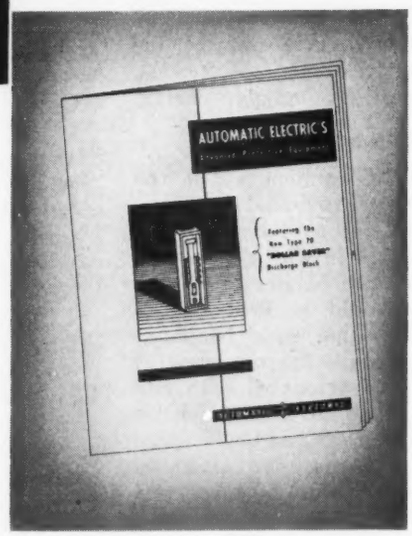


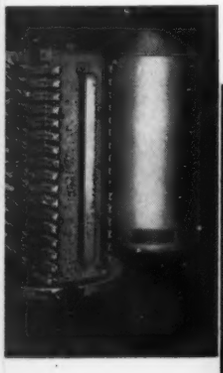
NEW TYPE 70 DISCHARGE BLOCK

NEW TYPE 18 SUBSTATION PROTECTOR



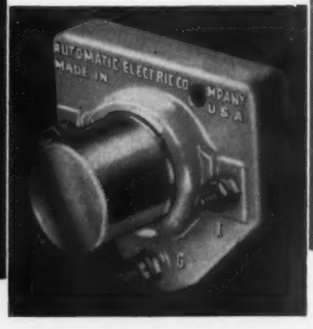


THESE AUTOMATIC ELECTRIC PROTECTIVE DEVICES ALSO FEATURE THE NEW TYPE 70 DISCHARGE BLOCK

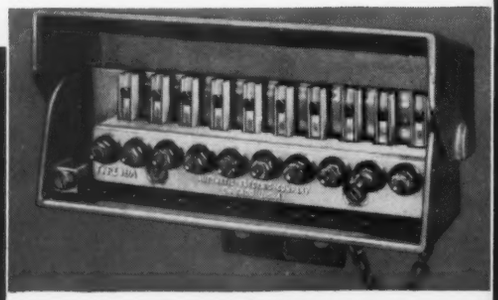


Type 35 Protected Cable Terminal

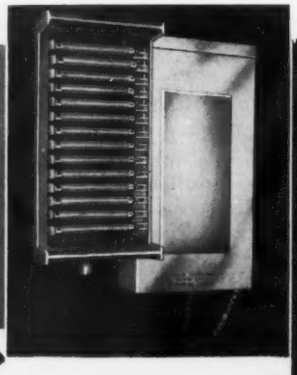
Type 16 Substation Arrester



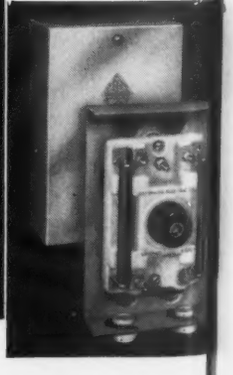
Type 19-A Crossarm Arrester



Type 40 Protected Cable Terminal



Type 20 Substation Protector



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brings you even greater economies

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We *planned* our new Type 70 Discharge Block to *slash maintenance*
(that's why we call it the Dollar-Saver).
It is self-grounding, self-resetting,
and its metal-to-carbon gap does away with troublesome "dusting."
Type 70 grounds the line upon operation—
avoids excessive wear on the sawteeth and carbon blocks—
gives you *superior power-cross protection!*
Type 70 is featured in our new Type 18 Substation Protector,
in our Type 20 Substation Protector, Type 19-A Crossarm Arrester,
and Types 35 and 40 Protected Cable Terminals.

All our new, dollar-saving protective equipment is ready for you now.
It's fully tested in laboratory and field.

Our helpful new Protective Equipment Catalog is ready, too, with full details on our complete, extra-economical line. Write for Catalog 4068-B today!

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Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems
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Telefonaktiebolaget L. M. Ericsson of Stockholm, Sweden, and associated companies are manufacturers of all kinds of telephone and signal equipment of every size and for every purpose.

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the mouthpiece and speak distinctly. Ask questions tactfully. Answer questions politely. Try to sound pleasant; try to be helpful. End conversations by using a phrase like "goodbye" or "thank you for calliing." Never merely hang up.

When these six points of good telephone usage are faithfully adhered to, customers coming in contact with the employees will always have an impression of courtesy and efficiency, which is a very important factor in building and retaining customer good will.

New Twin-Helix Earth Auger For Accurate Drilling

KNOWN AS the Pengo earth auger, a new twin-helix auger for use with all popular makes of power driven earth boring machines is now in production by Peterson Engineering Co. of San Francisco and Santa Clara, California. The new augers are manufactured in nine sizes for hole diameters up to 36 inches. The augers bore holes of exact diameters specified, avoiding holes of excessive size. In addition to drilling ordinary ground, it is claimed that the auger will bore holes in hardpan, decomposed rock, and some kinds of caliche and sandstone. The twin-helix design of the auger eliminates back thrust against the side of the hole, making it possible to drill with less caving in sandy soil. *Figure* 2 illustrates the appearance of the new auger.

Each half helix is equipped with a shank plate, each of which is provided with replaceable cutting points of abrasion-resistant alloy steel. Maintenance costs, it is claimed, are substantially reduced, because wear takes place on the inexpensive replaceable cutting points and pilot bit where wear is intended to take place instead of on the auger itself. Trips to the shop for welding or repairs are thus eliminated.

Fig. 2—Pengo twin-helix earth auger as used on the Highway earth boring machine.

Saving Time In Station Maintenance Visits

WHEN THE telephone company makes it a practice to visit subscriber's stations to inspect and repair telephone instruments at regular intervals, it will be found that little or no maintenance work is required at many of the stations. These unnecessary visits can be eliminated by contacting the subscribers via telephone to determine if they are aware of any defects of their telephone equipment that would require a visit to their premises for correction. If the subscriber replies, for example, that the instrument cord is worn, the finger plate on the dial is bent, or the transmitter mouthpiece is broken, the defect can be recorded and the case assigned to a repairman during a slack period to handle. It is suggested that subscribers located in the same neighborhood be called for information regarding the condition of their equipment, so that travel time will be held to a minimum.

Signs Tell The Public What's Going On

PLANT MEN of the Ohio Bell Telephone Co. are experimenting with a new way of telling people what they are doing. A sign is used to tell the public that "Men are working to provide better telephone service." The sign explains exactly why the street is torn up.

The idea originated from the suggestion of an employe in the office of Ohio Public Utilities Commission. One panel on the sign explains that an expansion project is under way and another panel tells that an emergency repair job is going on. The men change the sign according to the story they have to tell.

The signs will probably be changed as time goes on. They may be made larger or the design changed depending upon the experience, suggestions and comments of the men working with them. But the idea looks like a good one that's here to stay.

Receiver Off Hook Gets Intensive Look

WITH the number of receiver-off-hook trouble reports in Canton at an uncomfortable high, the Ohio

Bell Telephone Co. started a program to help remedy the situation. Having one of the lowest indexes in the Bell System on this class of trouble reports, Ohio Bell is calling attention to the importance of keeping the telephone on the hook through a series of newspaper advertisements, "Ohio Story" commercials and a special "Bulletin."

The plant department also has a routine which consists of notifying customers by post card on first report that their receiver is off, calling them by telephone on the second, and turning over the case to a representative from commercial on the third. The representative contacts the party to point out how this condition affects service.

LONDON:
Coin Box Thief

NEWEST CASE to baffle Scotland Yard concerns a coin-box thief who has invented a secret looting device. According to Scotland Yard and provincial police the culprit is an elderly man who has retired with a fortune, the proceeds of many coin box robberies from telephones. The loss to the government is thought to be about $27,500.

Scotland Yard believes the thief probably was an engineer who achieved an almost perfect form of crime. Not content with his tremendous haul, he has made copies of his secret device and it is thought that he has hired these out on a percentage basis to a number of other thieves.

One of these instruments is being examined at Scotland Yard. Details of the instrument are being kept a close secret; if the specifications were known, no coin box would be safe.

For many years large sums of money have been abstracted from telephone boxes through the use of the cunningly devised instrument, which gets silver without leaving any trace of the robbery. It is similar to an artificial hand, so slim that it can be inserted into a box. A check on a number of coin-boxes in London has shown that it was possible to average as much as $14 a box in one night.

Rison, Ark. Co-op Granted Charter

A CHARTER has been granted by the Arkansas secretary of state to the recently formed Rural Telephone Co-operative Inc., Rison, Ark., which plans to develop a modern rural telephone system covering Cleveland County and extending into other counties.

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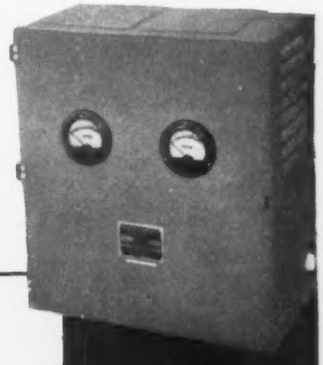
(Battery Chargers)
HELP PROTECT UTILITY POWER LINES

The same dependable RectiChargeRs, so widely used throughout the Telephone Industry, help guard your community against power and light failure. Operating unattended in remote sub-stations, they charge the batteries which operate circuit breakers — help guard power lines against lightning surges, provide circuit protection during storms and other emergencies.

Power companies prefer Raytheon RectiChargeRs for the same reasons you do . . . because they are fully automatic — maintain constant voltage output over the complete load range — follow the load and compensate for wide input changes — never overcharge or undercharge — contain no tubes or moving parts to wear out — require routine inspection only once or twice a year.

RAYTHEON®
Excellence in Electronics



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RAYTHEON PRODUCTS INCLUDE: RectiChargeR* battery chargers; RectiFilteR* battery eliminators; Voltage stabilizers (regulators); Transformers; Tubes and other electronic equipment.

*Reg. U. S. Pat. Off.

Specify Raytheon RectiChargeRs and RectiFilteRs for completely dependable Telephone service. Your supplier offers a complete line for all requirements. Ask him for details or write direct.

"Future plans envision even greater accomplishments in railroad communications."

Nearly 700 Attend AAR Meeting

NEARLY 700 railroad representatives from all sections of the United States and Canada, meeting at the Edgewater Gulf Hotel in Edgewater, Miss., last month for the three-day annual convention of the Communications Section of the Association of American Railroads, were told by one of their members that the number of modern communications facilities placed in operation by the nation's railroads has virtually trebled over the last three years, and that future plans envision even greater accomplishments in the railroad communications field.

During the sessions, more than 100 special papers, talks, reports, and demonstrations dealing with all phases of communications were directed at the railroad communicators, with subject matters including television, microwave, and new types of radio and telegraph equipment which have recently been installed or which are planned for near-future installation.

C. O. Ellis, Superintendent of Communications for the Chicago, Rock Island & Pacific Railroad and vice chairman of the Communications Section, presided at the meeting. Mr. Ellis, substituting for Section Chairman J. R. Smith, assistant to vice president-communications for the Southern Railway System, told the meeting that well in excess of 100,000 persons are already employed by the railroads in communications work, and the need for technical experts is expected to grow as the rail industry continues to expand its communications facilities. In addition to the expansion of radio and electronics, he said, the railroads are now in the process of taking over telegraph facilities previously operated cooperatively.

F. H. Menagh, superintendent of communications for the Erie Railroad and chairman of the Communications Section's Radio and Allied Communications Committee, outlining the recent expansion of railroad communications facilities, said that as of last May there were 10,625 authorized base and mobile radio stations and inductive carrier installations, compared with 3613 of the communications outlets in the same month of 1949. Also, he said, the number of railroads using either radio or inductive carrier systems, or both, now total 114, an increase of 42 lines over the past three years.

Mr. Menagh said that the latest number of railroad base and mobile communication units now extends more than 40,000 road miles over which messages and reports are transmitted and received by trainmen responsible for carrying out safety and operational instructions. He also pointed out that the rail-operated radio and inductive carrier equipment is exclusive of the more than 194,000 miles of telephone and telegraph facilities operated by the railroads.

Presenting some of the problems which might be encountered in the installation of microwave communication systems for railroad purposes, L. R. Thomas, electronics engineer for the Atchison, Topeka & Santa Fe Railway, said that while "in the past there has been some thinking that the installation of microwave equipment might be a cure-all for the problems the railroads have with the installation and maintenance of pole lines, (but) at the present time this is not true."

The present state of the art, he said, is such that the equipment available is far more complicated than other equipment used by the railroads and by its very nature requires a higher degree of maintenance. Also, he pointed out, maintenance personnel must have a higher degree of training and be more competent than the average service man now employed in the railroad field. There are technical problems still to be overcome concerning dropping out channels at each repeater station for local service, Mr. Thomas said, and at present there is not enough information available covering propagation for anyone to be able to lay out a system and guarantee operation "of the degree demanded by the railroads."

During a demonstration of the latest Bell System developments in microwave radio relay, presented by a group of telephone experts from the American Telephone & Telegraph Co., the Southern Bell Telephone Co., and the Bell Telephone Laboratories, the gathering was told that the Bell System is aware of the need for fast communications in industry, and already has solved many problems for radio, television, oil, railroads and other industries.

C. W. Floyd, area commercial manager of AT&T's Central Area, Cincinnati, in an opening discussion, stressed the great advances in communications which have taken place in the past eight years, citing the

(*Please turn to page* 58)

ANSWERS TO QUESTIONS

asked at the Convention about the Peatrophone

PRONOUNCED "PETE"

1. Delivery few weeks after order received.
2. The PEATROPHONE works on magneto as well as dial system.
3. It records over 130 consecutive messages on one side of the record.
4. The Beep note is built in.
5. Service manuals are provided and while the PEATROPHONE requires little service it is extremely easy to maintain. A complete repair service is available at the factory. A Service School is also maintained at the factory to train your service men.
6. Your PEATROPHONE and records will be provided with your Company name in the place of "PEATROPHONE", if desired.
7. It is designed to use as an announcement machine only, simply by leaving the record arm on the hook.
8. It is designed to be used as an extension telephone and will take all incoming calls if desired, as it is not disturbed by the dial pulses of another extension while dialing out.

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transcontinental radio relay system and national television network as examples of the Bell System's efforts to fulfill the demands for broadband communication facilities. Others taking part in the demonstration included C. J. Tucker, Jr., general sales manager of Southern Bell, Atlanta, and Robert D. Trammel and Gordon Harms, of AT&T's engineering staff in Atlanta. Mr. Trammel said that there are 4600 miles of radio relay facilities now in use, with 12 communications lanes being used on each beam. Six lanes are used in each direction, he explained, and any two of these can be used as a telephone system with 600 circuits.

Other presentations included papers on industrial television and its application to railroading, by R. W. Deichert, of the Research Division of the Allen B. DuMont Laboratories; on dispatcher-to-train radio communication systems by F. L. Steinbright, superintendent of communications for the Northern Pacific Railway; on a loud-speaker LCL freight check system by J. L. Niesse, general superintendent of communications for the New York Central System; and on an electronic line multiplier by G. D. Poole, assistant superintendent of communications for the Erie Railroad.

Mr. Deichert, describing the basic principles of television and pointing out the application of TV to industrial use, with particular emphasis on railroading, said that the use of television in railroad operations "has reached the stage of being practical and will result in increased economy through either direct labor displacement, more efficient use of labor, or the avoidance of costly delays." He said the television industry "welcomes inquiry" from industry concerning industrial applications of TV and is ready to supply television equipment "tailored to fit" a particular situation.

Mr. Steinbright, in a short paper on the dispatcher-to-train communication system now in service on the Northern Pacific, touched on the importance of the base radio stations in time of loss of wire line facilities for emergency point-to-point communication.

TID-BITS

IN VALPARAISO, IND., the water department received a telephoned request to turn off the water at Banta School and a clerk asked the caller who was authorizing the action, the small-voiced reply was: "Us kids, so we won't have to go to school."

* * *

IN SOMERSET COUNTY, ME., motorists are confronted with this road sign: "Our telephone poles hit cars only in self defense."

* * *

IN AMARILLO, TEXAS, a cable repairman recently found a hunting arrow embedded in a 900-pair alpeth cable. And in Fort Worth, a wild driver hit a barded-wire fence so hard it bounded into the air and knocked out service to several telephones.

* * *

IN BIRMINGHAM, ENGLAND, a subscriber told the operator—"My wife was cut off in the Middle and no attempt was made to reconnect her."

The Railway Telegraph & Telephone Appliance Association, in elections on the second day of the sessions, named H. F. Timmins of the Kellogg Switchboard & Supply Co. as chairman of the group, W. A. Edwards of the Kerite Co., as vice-chairman; and renamed G. A. Nelson, of the Waterbury Battery Co., as secretary-treasurer. The Executive Committee of the railroad supply group, besides the chairman and vice-chairman, includes C. Buck, AT&T; F. W. Dickerson, Graybar Electric Co.; D. P. Dickie, Western Union Telegraph Co.; G. Ramsey, Fansteel Metallurgical Corp.; W. J. Savage, Thomas A. Edison, Inc.; J. Bowen, Electronic Communication Equipment Co.; E. J. Gross, Fahnestock Electric Co.; and retiring Chairman P. J. Salerno, the Okonite Co., as an honorary member of the committee.

Social arrangements for the AAR Communications Section meeting were handled by the Appliance Association's Entertainment Committee, consisting of Mr. Timmins; Mr. Bowen; and J. M. Phillips, Mississippi Manager, and J. C. Dabney, of Southern Bell.

Exhibitors at the conference included the Automatic Electric Sales Corp.; the Bendix Radio Division of Bendix Aviation Corp.; the Bogue Railway Equipment Division; the Buckeye Telephone & Supply Co.; Electronic Communication Equipment Co.; Federal Telephone & Radio Corp.; General Electric Co.; Graybar Electric Co.; the Kellogg Switchboard & Supply Co.; Motorola, Inc.; the Philco Corp.; and the Westinghouse Electric Corp.

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POSITIVE PROTECTION is your assurance with our experienced personnel operating modern equipment and using PENTA, the *clean* wood preservative. Fast service, too. Write for complete information.

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Jay G. Mitchell

QUESTIONS AND ANSWERS

Edited By
JAY G. MITCHELL

In this issue Mr. Mitchell discusses—(A) Low Impedance Switchboard Drops; (B) The Unit of Conductance, and (C) The Multimeter Decibel Scale.

QUESTION:—Concerning the problem the man with the ten telephones on a line who could not ring each other; his switchboard might have been a 100-ohm drop coil. A 500-ohm drop coil is better with 1,000-ohm telephones. I have several long lines with ten or more telephones, and they work good.

ANSWER:—This comment on a recent inquiry in QUESTIONS AND ANSWERS is strictly of interest and touches upon a point that was not covered in the answer to the original question as it certainly should have been. Many thanks to this correspondent for writing in and calling attention to the omission.

The switchboard drop, except in the case of telephone circuits equipped with grounding keys for calling the switchboard, is across the telephone line at all times except when the operator has put up a connection and a plug is resting in the line jack. Since this is the case many times it is necessary that a drop be used which will not cause a serious transmission loss when it is bridged on the line as when two telephones are connected on a call which does not involve the switchboard.

On the other hand, for straight bridged multi-party lines, of the sort not equipped with grounding keys for calling the switchboard, it is most important that any connected telephone shall be able to call the switchboard. In order to insure this certainty the switchboard drop should be of a type that will *always be operated* when any telephone on the line turns the generator crank.

This is important because even when the telephone stations cannot ring each other the switchboard almost always can and should be able to do so *always*. For these reasons the drop on the line should be the most sensitive possible type as far as ringing current is concerned and of the highest impedance to voice carrying currents in order to limit transmission losses when stations on the same line are talking. It is to be remembered also that the direct current resistance of the switchboard drop, especially in older types of equipment is not a reliable indication of either their sensitivity or their impedance to voice currents. With entirely enclosed tubular drops it may be the case that the impedance to voice currents is sufficiently high to prevent noticeable transmission loss when the winding measures only 200 ohms by direct current methods. In other words it is essential that the type of drop be taken into consideration in these situations and that the one be selected which will always be operated when a connected telephone attempts to make a call while, at the same time, its impedance is sufficiently high to prevent noticeably serious transmission loss when it is across the line. This is an important point and the suggestion in this inquiry is greatly appreciated.

QUESTION:—In reading an article on electrical circuits recently I encountered the expression, as to a certain piece of the equipment, that its conductance was 0.005 mhos. This seemed to be an important part of the description of the device but I could not fully understand just what it meant. Can you explain the expression in such a way as to make it clear?

ANSWER:—Every conductor of electric current has properties which cause it to offer more or less opposition to the passage of a so called electric current. If the conductor is of uniform cross section this opposition to the passage of a steady electric current is directly proportional to the length of the conducting path for the current. If it is uniform in length with other conductors the opposition to the passage is reduced as the cross section of the conductor is increased. If the cross section of an iron wire is twice that of another iron wire of the same quality then the opposition of the larger wire, which has twice the cross section of the first, is one half that of the smaller wire. For the ordinary steady current this is similar to the ability of a pipe to carry water under pressure.

A copper wire which is 1,000 feet in length and 0.102 inches in diameter (Number 10 Brown and Sharp Wire Gauge) has a resistance of almost exactly one ohm at ordinary temperatures (70 degrees F.). A copper wire which is 1,000 feet in length and 0.072 inches in diameter (Number 13 Brown and Sharp Wire Gauge has a resistance of almost exactly two ohms at ordinary temperatures (70 degrees F.). Now if you will compute the cross sectional area of these two copper wires you will find that the Number 10 copper wire has a cross sectional area of almost exactly twice that of the number 13 copper wire and almost exactly one half the resistance. The reason that the results are stated as almost exactly as shown is because there are several variables involved including the quality of the metal and possible slight variations in the exact diam-

(Please turn to page 62)

BEYOND THE LINE OF DUTY...

You in the telephone business know how frequently telephone men and women perform acts of valor in time of fire and flood, explosion and storm. To the general public, these stories of heroism and unusual community service are less familiar.

So advertisements like the one across the page — appearing in national magazines for November — remind millions of readers that telephone people are dependable, resourceful, public spirited people. In time of emergency, their service to their communities goes far beyond the regular job of keeping America's telephone service the best on earth.

"THE KICKAPOO RIVER IS LOOSE AGAIN"

Heroic Operator helps protect town from flood

Awarded Vail Medal for courage, initiative and devotion to duty. Honored at civic dinner.

It was a quiet Saturday morning in Gays Mills, Wisconsin. A steady rain had drenched the town and folks were staying indoors.

Then suddenly a flash came by telephone to Mrs. Wilma Gander, the town's chief operator. "The Kickapoo River is loose again, fifteen miles upstream."

Although Gays Mills did not appear in imminent danger, Mrs. Gander had been through floods before and she had the foresight to see what might happen. So she pressed the button on her switchboard that set off the village fire siren.

Immediately people began calling in and rushing in. "Where's the fire?" they asked.

"No fire," answered Mrs. Gander. "It's a flood. The Kickapoo's over its banks and the flood is headed this way."

Quickly the word was passed. People collected such belongings as they could and made their way to safer places.

Mrs. Gander next alerted the Red Cross, the National Guard and the Army and called in a lineman to help prepare the telephone exchange for high water.

By warning the town, remaining at her post, and keeping telephone service going, she helped to protect the lives and property of hundreds of people.

Mrs. Gander was honored by the grateful citizens of the town at a civic dinner. The Bell System awarded her the highly prized Theodore N. Vail Medal and presented a commemorative bronze plaque to the Utica Farmers Telephone Company.

Vail medals, accompanied by cash awards, have been given annually by the Bell System since 1920 for acts of noteworthy public service by telephone employees.

HELPING HANDS—This is one of the many stories of the skill, courage and resourcefulness of telephone men and women in times of emergency. . . . Not all of them tell of the saving of a town or a life. But there is scarcely a minute that someone in trouble or urgent need does not turn to the telephone for help. . . . **BELL TELEPHONE SYSTEM**

(Continued from page 59)

eter from the listed figures. The law as to the relation between sectional area and resistance per unit of length is as stated for any given conductor however size and any given conductor. Of course there is a difference in the resistance per unit length and per unit sectional area between different conductors, the resistance of iron being higher, for illustration, than that of copper of the same length and sectional area. The resistance of any given conductor, to steady current, however may be stated in ohms per unit length for a given sectional area. Now the matter is complicated somewhat when the electric current in the conductor is not steady as will be shown in the answer to another inquiry in an early issue.

For steady current the ohms is the unit of resistance and the mho is the unit of conductance. For a given conductor whose conductance, as stated in the inquiry, is 0.005 mhos the resistance in ohms is the number which when multiplied by the number of mhos will equal one. In other words the conductance in mhos of any electrical conductor is the reciprocal of its resistance in ohms. A reciprocal of any given quantity is one divided by that quantity so in this inquiry 0.005 (which is equal to

$$\frac{5}{1{,}000} \text{) equals } \frac{1}{200}$$

which is the reciprocal of 200 ohms. The conductance of a conductor which has a resistance of 0.005 mhos is, therefore, 200 ohms.

As an illustration of this explanation of the mho consider a circuit which has a resistance to steady flow of electric current of 400 ohms. Applying the rule as set out above this circuit would present a conductance

$$\frac{1}{400}$$

for steady current of or 0.0025 mhos. It is obvious that this circuit of 400 ohms offers exactly one half the conductance of the circuit first specified and this is perfectly correct since its resistance is twice as high. If this is still not clear write in again.

QUESTION:—In a recent issue there was an explanation in QUESTIONS AND ANSWERS *of the decibel and it was very clear and presented no great difficulty in reaching an understanding of the term. However I have purchased a high grade multimeter and find that the meter has, along with several other scales, a scale marked decibels. This scale I cannot understand probably because of some fact in regard to it that has not been made available to me. Will you be so good as to publish an outline of the matter so that I may derive the full benefit from my multimeter that is possible? Thank you.*

ANSWER:—The inquiry does not identify the multimeter by the name of its maker and, for that reason, an explanation may be found a little indefinite. However the best types of meter that present a decibel scale are subject to the following explanation.

In the decibel scale the zero point is located where the needle of the instrument will rest when the instrument probes are in contact with a source of E.M.F. of 1.73 volts. The sockets marked with the word "decibel" lead, in the meter, to a loop which includes the meter itself and

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resistors sufficient to constitute a loop of a value such that the product, when the impressed E.M.F. is at this value, of the volts and amperes (that is the watts being expended in the loop) is equal to 0.006 watts. In other words the measurements on the decibel scale of the meter are based upon a reference value of 6 milliwatts.

It is obvious that if the source of power to which the instrument probes are applied is delivering exactly 0.006 watts (which would be at a voltage in this loop of 1.73) the power output of the equipment under test is neither more or less than 0.006 watts. Now if the source of power being tested is delivering 0.012 watts it is clear that the power being delivered to the loop of the instrument decibel circuit is double that delivered when the pointer rested at the zero of the decibel scale and the reading at this point should be 3 decibels. That is because an increase in power of 100% (that is doubling the power) represents a gain of 3 decibels. Likewise if the power source being tested should deliver to the instrument loop only 0.003 watts the ratio between 0.006 watts and 0.003 watts would be the basis for measuring the decibel loss which would be *minus* 3, since the entire scale of decibels is related to a base of 0.006.

It will be remembered that the term "decibel" is unintelligible unless the reference point is indicated definitely. In the assumed condition outlined above it must be understood that this scale would relate the decibel readings to 6 milliwatts and should be written $^{db}6$ for that reason.

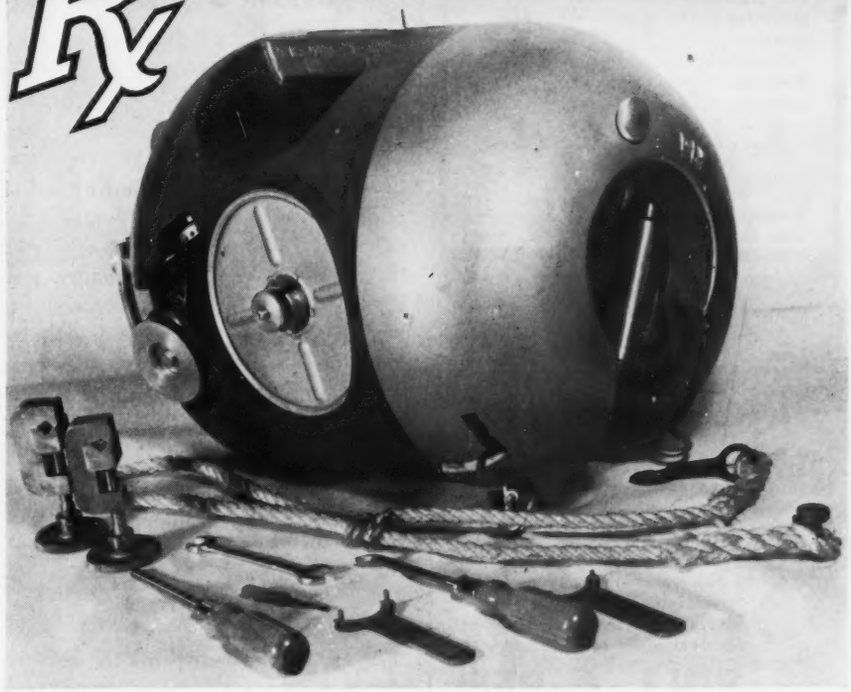
Those Earning $1.00 or Less Per Hour Exempt

ALL WORKERS paid $1 or less an hour were exempted from wage controls last month by Economic Stabilizer Roger L. Putnam. He acted after the Wage Stabilization Board unanimously adopted a regulation providing for the exemption as prescribed in an amendment to the Defense Production Act adopted by Congress earlier this year.

James R. Brock has been appointed works manager of Kellogg Switchboard & Supply Co., Chicago, an associate of International Telephone & Telegraph Corporation, President James H. Kellogg has announced.

Brock, who joined the Kellogg company in January, 1951, as assistant works manager, succeeds William A. McCracken, who recently was elected vice president. Before joining Kellogg, Brock was manager of the Aircraft Equipment plant, Stewart Warner Corp., Indianapolis. During World War II, he served as Communications Officer, Marine Air Corps, in the Pacific theater of operations.

Rx for Double-Purpose Jobs



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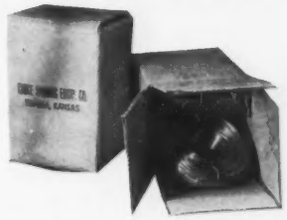

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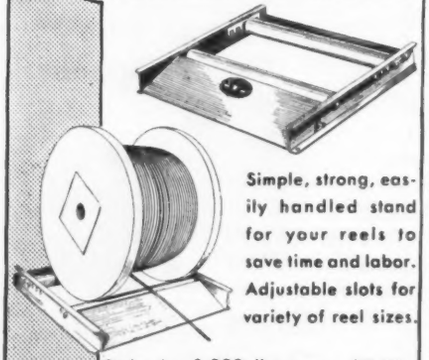

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That Drag Between Petition and Order

(*Continued from page 36*)

fect two rate orders where only one would ordinarily be sufficient. It may well be that a utility could make a good showing of special circumstances constituting a real emergency; however, in the ordinary rate case with the probabilities that the regulatory lag will not overpass the bounds of reason, "the emergency approach" should not be employed. From the viewpoint of public acceptance and public relations, it would be better for utility management to attempt to get one final rate increase rather than two lesser adjustments within a relatively short time.

Use of Trade Association Aids

IT SHOULD be obvious even to a schoolboy that incomplete or inadequate records and unintelligible exhibits are not conducive to the prompt disposal of a rate application. Yet for some unknown reason and despite the valiant efforts of local utility association secretaries and their staffs to aid these smaller utilities with such problems, there seems to be some inexplainable inertia to cooperate with them or to secure their help. No speeding up of a regulatory lag will help those who won't help themselves when it is available merely for the asking. The indolent or lackadaisical operator should either mend his ways or get out of business.

Bonds

IN SOME jurisdictions, a filed increase in rates takes effect after a given suspension period under provisos for refunding under bond if greater rates have been collected than allowed. This procedure requires legislation. It appears to be of some comfort to utilities but apparently it arouses more than ordinary antagonisms in the public and does not seem to afford any incentive for prompt disposal of rate cases. Perhaps the fear that utilities will over estimate the final allowance accounts for the public's opposition. In any event, it does not remove the losses suffered during the suspension period. Refunding, when and if ordered, is costly and time consuming and not always complete.

If the problem of the regulatory lag is to be solved with complete equity and at the least possible cost, some other method should be found.

Conclusion

ABOUT the only practical remedies available to utilities at present for reducing the regulatory lag is self help. Constructive suggestions may be summarized as follows:

(1) Adoption of a net investment cost base. This may be anathema to some utilities—but it must be conceded that it is a shorter road to rate relief.

(2) Certification of depreciation rates before a rate case. This removes a time consuming issue.

(3) Service of petition, proposed testimony, and exhibits upon probable opposing parties, the Commission and its staff. Exhibits and testimony should be as direct and precise as possible. This will eliminate time consuming analysis by the Commission staff and will shorten the hearing time.

(4) Employ the "make whole" approach by acquiescing in determination of major issues in a recent prior case. This eliminates all issues except the material changes since the last rate case.

(5) Study removal of objections to creation of suspension reserves or capitalization of transitional loss accounts with amortization thereof over a period of years. This may require legislation.

(6) Secure public acceptance of rate increase by removal of service complaints before a rate case; improve public relations generally.

(7) Secure technical aid from utility associations—especially the smaller utilities.

(8) Furnish bonds for possible refunds after suspension period. This may require legislation in some jurisdictions.

My own conclusion is that, after improving the ordinary techniques of presenting a rate case, legislatures, commissions, civic leaders and utilities should explore acceptable methods of capitalizing deficiencies and their counter part (excess earnings) as a possible substitute for the present haphazard method of counterbalancing inequities occasioned by the regulatory lag.—THE END.

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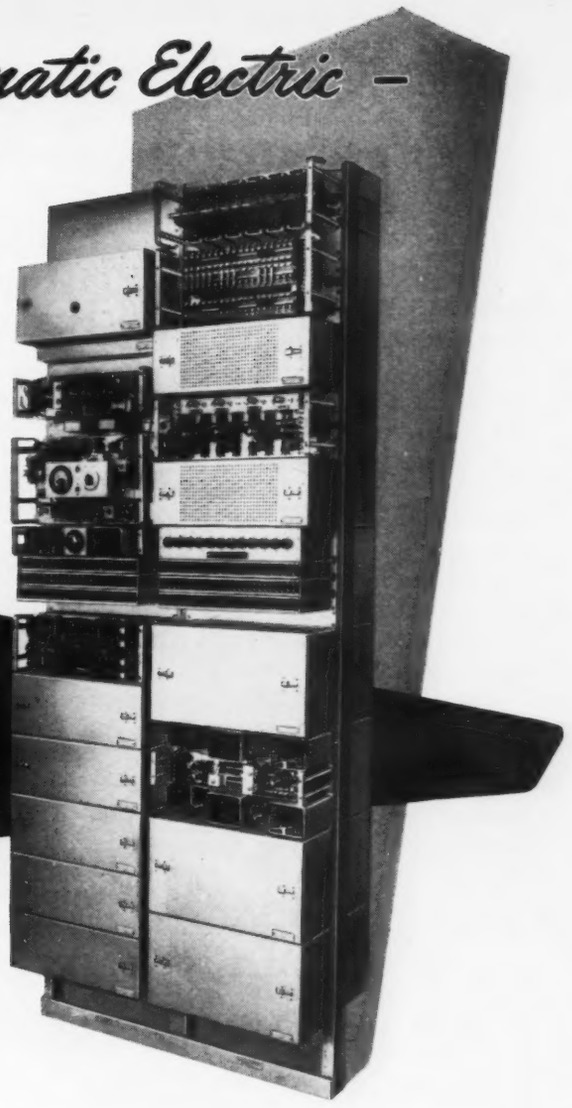

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(1) Conventional 1000/20 for ringdown applications.

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News Briefs

(*Continued from page 22*)

G. A. Klein, announced that the structure would be ultra-modern in detail and that the new equipment installed in it would be for dial telephone service, which was announced for McMinnville several months ago.

Indiana Citizens Protest Hoosier Tel. Co-op Plans

A RISING tide of protest against the way in which the Hoosier Telephone Cooperative, set up as the largest farm telephone borrower to date in the Rural Electrification Administration program, plans to organize itself and its business last month carried the hearings on the subject before the Indiana Public Service Commission through four days of sessions. They were then recessed to a later date.

Counsel for some of the intervenors —most of the intervenors are private citizens urging that telephone service in the area be continued in private hands—joined forces with the commission's Public Service Counselor, Walter F. Jones, Jr., to charge during cross-examination that the co-op's proposed financial structure is "shaky."

Specifically, it was brought out in questioning of the co-op's accounting witness, G. K. Skelton, that the organization's estimated net income of $112,000 would not permit amortization of the REA loan. REA has allocated more than $6,000,000 to the co-op, which plans to buy the "west side" properties of the John T. Detchon estate. Mr. Skelton declared that the anticipated net, which is based on a 70% increase in per-station local revenue, a sharp boost in per-station toll revenue, and a rise of 4500, or upwards of one-third, in the number of telephones served, would not permit retirement of any of the REA debt.

Subpenaed by attorney for some of the groups opposing the purchase, Indiana Bell Telephone Co. Assistant Vice President Russell R. Hirschman testified that his company would be willing to buy the exchanges at the appraised value of $780,000 set by the co-op if for any reason the latter is unable to proceed with its plan to obtain and operate the properties, or if it does not get approval.

Indiana Bell did not submit a bid on that part of the Detchon estate, although it is acquiring the "east side" part of the Detchon properties.

Legal points raised during the ses-

TID-BITS

IN KANSAS CITY, an elderly woman called a telephone operator and said: "My telephone cord is too long. Will you please pull it back at your end until I tell you to stop?"

IN NEW YORK a telephone executive was guest on a commentator's show which offered listeners a pair of stockings for every question used. One listener wrote, "Why don't they widen the seats in the public booths? The size should be 9-C." The executive assigned baffled technicians to do research on 9-C seats. They finally learned the listener was just providing her stocking size in case she won.

HOW TO CREATE JOB ENTHUSIASM

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248 pages, 5 x 8, illustrated, $2.25

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The book is arranged as a kind of "three-cornered conversation" among the book, the reader and the author. The main argument is carried on logically and impersonally by the book. However, this thread is broken time and again by the author, who offers examples and personal observations to point up the discussion. Whenever he "puts his oar in" in this way, the type is indented and set smaller face. This illustrative matter comprises a broad range of actual case examples.

The book presents five "flow charts" that give graphically bird's-eye views of the ideas developed. After the book has been read, examination of these flow charts in sequence will furnish an accurate review of the whole presentation.

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sion pertained particularly to the co-op's lack of any equity capital, and the contention the group is not properly organized under the 1951 Indiana rural telephone legislation. The co-op's equity capital, as required by REA, actually is borrowed from rural electric cooperatives, and therefore is simply more debt capital, it was brought out. In addition, it was declared, organization under a 1935 law relating to non-profit organizations is improper, on the basis that the 1951 rural telephone statute preempts the field and applies specifically.

Intervenors in the proceeding include a group of citizens from Attica, Ind., including the city attorney, newspaper publisher, and other civic leaders; another group from Milford, Ill.; and the United Telephone Co., which raised the legal points.

Plans of the co-op—if the Indiana commission grants the necessary approval—are for the co-op to acquire 13 Indiana telephone companies and two in Illinois. The REA loan would amount to $6,618,000. The equity, to be borrowed, from rural electric co-ops in the area, would total $286,000.

Earlier hearings before the Indiana commission on the "west side" properties were held Sept. 29-30, at which a number of subscribers opposed the co-op's purchase plan.

Old Town Contract Approved By REA

THE OLD TOWN Telephone System, Inc., Winston Salem, N. C., has been notified that the Rural Electrification Administration has approved its contract with B. O. Vannort Engineers Inc. of Charlotte, N. C., to provide telephone engineering mapping service in connection with its expansion program.

Officials of the telephone company said much of the work covered by the contract has been completed in an attempt to expand the system's service as soon as possible.

The expansion program is being financed by a loan agreement already signed with the REA.

Dexter A. Rau Retires From Associated Tel. Co., Ltd.

THE RETIREMENT of Dexter A. Rau from 28 years of service with Associated Telephone Co., Ltd., Santa Monica, Calif., was observed by execu-

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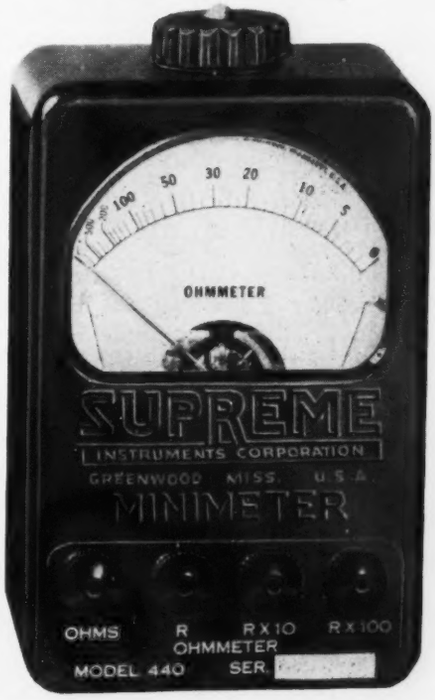

The Supreme Model 440 Ohmmeter, a truly "vest pocket" instrument about the size of a cigarette pack, is a favorite companion of telephone men everywhere. Its popularity does not come from size alone. Inside the molded case is a genuine Supreme jeweled meter movement with that famous tough pointer. It is a quality instrument throughout.

Convenient size and durable construction for portability. Built with highest quality materials and workmanship for dependability. Quantity production for a budget price. Write for additional information on the Supreme Model 440 Ohmmeter and other instruments in the Minimeter family.

Our 25th Year SUPREME, INC. GREENWOOD 19, MISSISSIPPI

tives and other long-time associates at a recent luncheon at the Santa Monica Y.M.C.A. and a dinner in Westwood. He was presented with a portable radio, an electric shaver and an Elgin wrist watch by his fellow workers.

Rau's telephone service began in 1924 with his employment as a storekeeper in the Pomona Telephone & Telegraph Union, a predecessor of the Associated company. Following a varied experience there as plant accountant, collection manager, auditor and assistant manager, he became commercial agent of the Associated company in 1930. Among other positions of responsibility, he has served as assistant to the general agent, general rate engineer, tax engineer, and for the past six years was claim agent. He retired September 30 under provisions of the company's pension plan.

Born in Pasadena, Rau is a graduate of Riverside Business College, Pomona College (B.A. 1910) and Chicago University (B.A.S. 1913). In 1917 he enlisted in the infantry and rose to the rank of first lieutenant and commanding officer of Co. A, 160th Brigade. He was married in 1918 to Laura Grace Rice of Atlanta, Georgia, and the couple have a son, two daughters and two granddaughters.

Dexter A. Rau

Alabama Retains Nickel Phone Call

THE NICKEL telephone call will remain in effect in Alabama for at least a while longer.

The Public Service Commission has refused to permit a Southern Bell telephone rate increase which would have raised the price to a dime.

Commission President C. C. Owen said the commission found the rate hike was "not just and reasonable." It ruled that the "proposed increases are not justified and hereby are disallowed and denied."

The present rates, set last February, were ordered continued.

M. O. McCarty Joins Indiana Tel. Assoc.

C. E. MCCORMICK, president, and W. H. Beck, secretary-treasurer of the Indiana Telephone Association have announced the appointment of Mendel O. McCarty of Indianapolis to the position of assistant secretary of the association.

Mr. McCarty, 30 years of age, is a native Hoosier and a graduate of Indiana University. He also studied law after his graduation from the university. His business experience includes executive positions in the publicity and public relations departments of the Indianapolis Better Business Bureau and the Union Title Company. He is a member of the Board of Directors of the Indianapolis Junior Chamber of Commerce, a member of the Counsel of the Indiana University Alumni Association and belongs to numerous local and national organizations.

The Executive Committee of the Indiana Association has adopted a program of expanded activity for the organization. It will include state wide publicity for the industry, well planned programs of publicity and public relations for individual companies in their own localities, closer and more detailed relationship with member companies on regulatory matters and the accumulation of date and statistics for all state telephone companies which will enable the Association to tell a factual story of the magnitude and importance of Indiana Telephony.

While Mr. McCarty, or "Oz" as his friends call him, will give his attention to all Association activities, he will pay particular attention to publicity and public relations matters.

Driggs Named Gen. Mgr. Texas Telephone Co.

WITH A BACKING of 30 years in the telephone business, William M. Driggs, formerly of Bloomington, Ill., has become general manager of the Texas Telephone Co., with headquarters in Sherman.

E. H. Danner, Texas Telephone Co.

(*Please turn to page* 70)

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With the Double
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gould planté . . .
the aristocrat of stationary batteries

Many Planté batteries are still in active full-float service after twenty, thirty, even forty years! That's because Planté plates are heavy, solid sheets of pure lead. In these batteries Gould has eliminated the primary cause of self-discharge, capacity losses and shortened battery life. Cut maintenance, charging and replacement costs to a minimum. Choose Planté.
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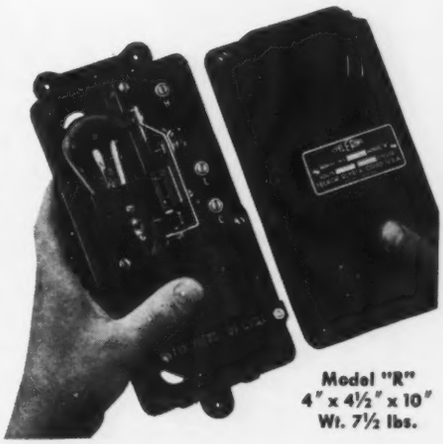

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PERSONALIZED SERVICE

(Continued from page 68)

president. announced that Driggs, who has been general plant superintendent for the Illinois Telephone Co. at Bloomington, had accepted the position in Sherman.

He has taken over duties in the past that have been performed by Danner and Sam C. Shutt, vice president who has been serving as assistant general manager.

Driggs attended the University of Illinois and is a registered and professional engineer in the State of Illinois.

In 1922 he entered the telephone business as an employee of Illinois Bell Telephone Co. He remained with this company until November, 1944, when he joined the company in Bloomington.

While in Bloomington, Driggs served as chairman of the plant committee of the U. S. Independent Telephone Association, and was also a member of the plant committee of the Illinois Telephone Association.

Plans Announced For German Exhibition

THE GERMAN Communication and Transport Exhibition will take place in Munich from June 20 to October 11, 1953.

It will offer the first comprehensive survey since the war, of conditions and problems facing communication and transport to-day.

This exposition continues the tradition of the German Communication and Transport Exhibition which took place in Munich in 1925 and attracted about three million visitors. The Bavarian capital is already preparing for this exhibition and wishes to prove that it too can be counted among the leading fair and exhibition centres.

The Munich Exhibition Park (Ausstellungspark) is being modernized. New exhibition halls and a congress hall are being erected.

The exhibition ground covers a total area of 470,000 sq. yds. including 14 halls covering 42,000 sq. yds. and open ground extending over 170,000 sq. yds.

There will also be a station, a cable car, a miniature railway for passenger-service, a helicopter base and a pleasure ground.

Parts of the Munich aerodrome in Riem will be connected with the exhibition on the Theresienhöhe.

New Construction Methods

(*Continued from page* 41)

around a core of 109 high strength steel wire without a protecting outer sheath or jacket. Two kinds of insulated wires are being tried out for the cable. One is composed of polyethylene insulated 19 gauge copper conductors, and the other, of neoprene-jacketed rubber-insulated 20 gauge copper conductors.

Being very light in weight and small in diameter, this cable can be attached either directly to poles or to the underside of crossarms. The conductors are readily accessible for splicing or connecting to subscriber's drops.

Trial installations of the five-pair cable have been made at Manchester, Drayton Plains and Lake Orion, Michigan.

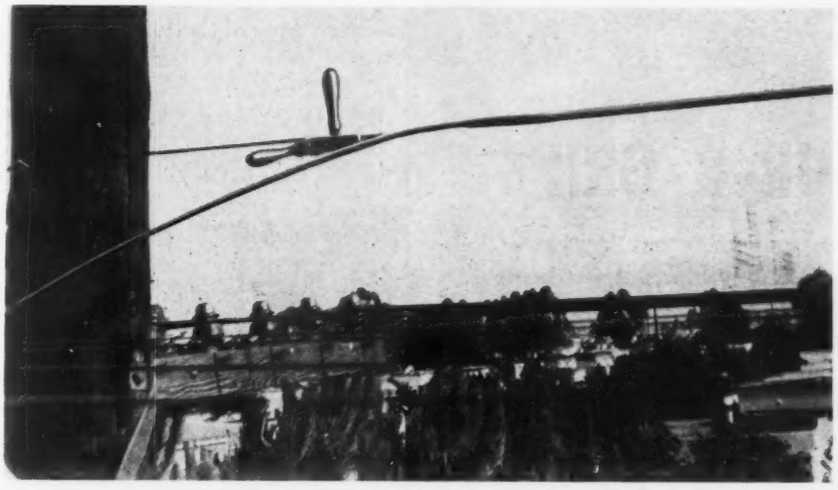

Fig. 28—Once the tubing is inserted it is applied to the wire.

Fig. 29—Here the lineman is drawing a second 20 foot length which has just been applied.

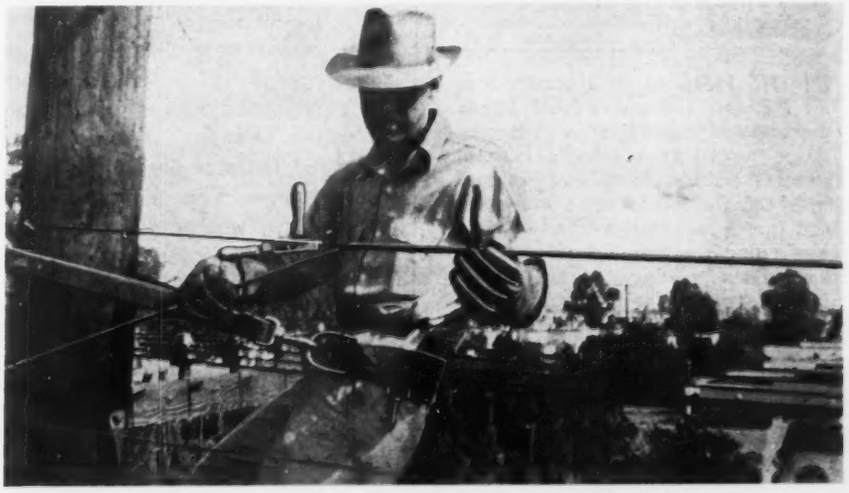

Fig. 30—Having fastened the ends of the tubing with tape the line jacket is ready to be run onto the wire by means of the hand tool.

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Rocky Mountain Group Holds Annual Meeting

By Sec., J. W. BAKER

THERE WERE some hundred members of the Rocky Mountain Telephone Association in attendance at their sixth annual convention, held at the Newhouse Hotel, Salt Lake City, Utah on September 18-19. The home States of Arizona, Colorado, Idaho, Montana, New Mexico, Utah and Wyoming were well represented, as were those of California and Washington, with a sprinkling of visitors from Illinois, Oregon, Kansas, Missouri, Ohio, North Carolina and New York. Those who made the trip from the faraway states found the time and effort spent in traveling to the convention city well worthwhile. Here are some of the reasons they found the meetings to their liking:

President J. W. Corbin presided at the meetings, which were opened by the introduction of the Honorable J. Bracken Lee, Governor of the State of Utah, Salt Lake City, Utah. Governor Lee in welcoming the members to the State of Utah and in particular Salt Lake City, congratulated the group upon the organization and wished them every success in their undertakings and that their meetings might lead to greater accomplishments on the part of the Independent telephone industry.

After making a response to Governor Lee's address, President Corbin reported on the affairs of the association during the past year, stressing the good work of the Committee on Small Company Affairs, headed by Chairman, T. Clark Callister. Secretary-Treasurer J. W. Baker reported on the financial status of the association and read the minutes of the last meeting.

After these preliminaries, Douglas R. Stringfellow of Radio Station KLO, Ogden, Utah, who needs no introduction to many of our readers, addressed the members on the subject: "Choose You this Day." Mr. Stringfellow, who was a member of the Office of Strategic Service in World War II, described some of his experiences while being held in the Belsen Prison camp.

The morning session concluded with the showing of the film, "The Farmer and the Telephone" (R.E.A. produced) which was of interest to all.

The afternoon session opened with

an address, "Communications Services for Right-of-way Companies," presented by Paul E. Harward, general sales supervisor, the Mountain States Telephone & Telegraph Co., Denver, Colo. He brought the members up to date on the subject by his realistic review of the various forms now being used for right-of-way contracts.

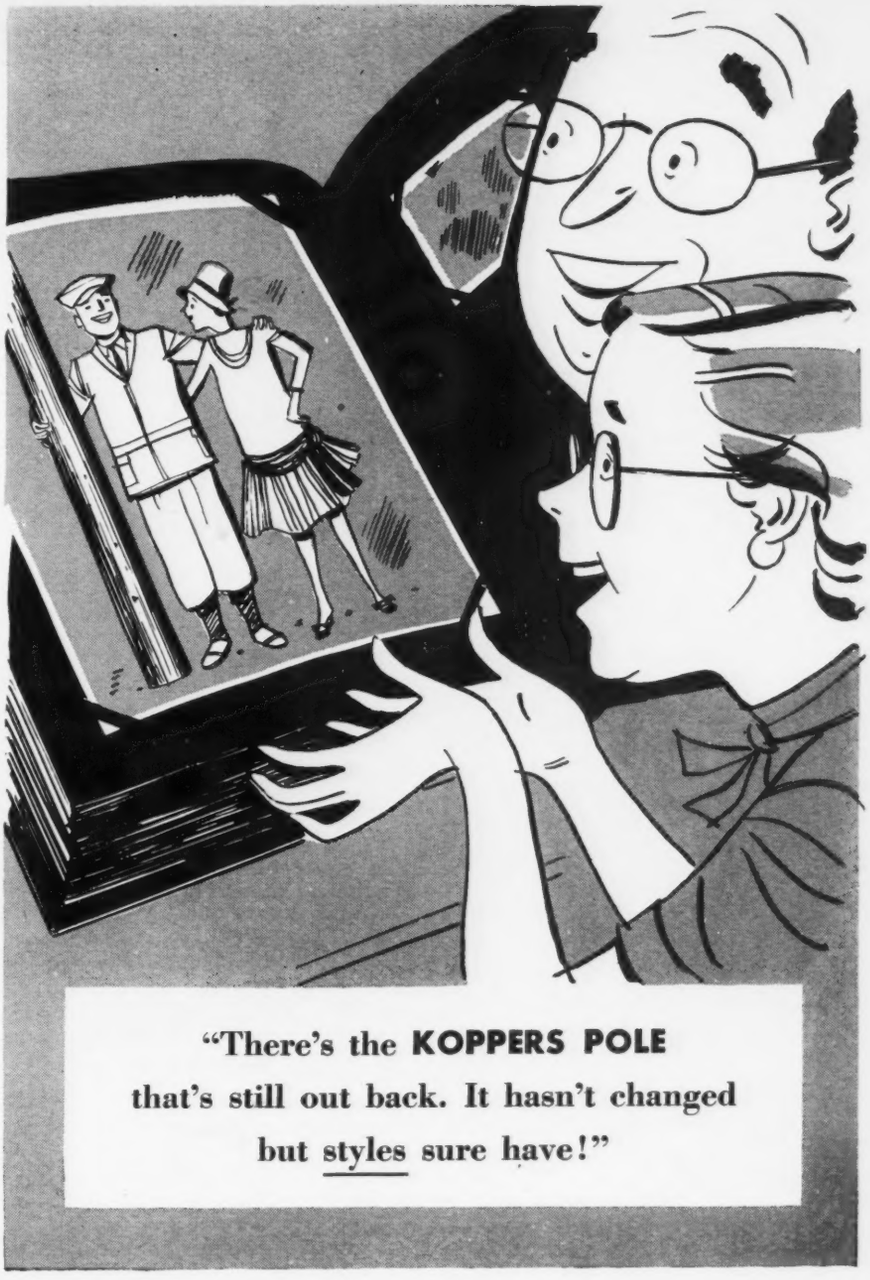
"The Independent Telephone Industry in Changing Times", was the address given by L. W. Hill, then president of the United States Independent Telephone Association. Mr. Hill is president of the Carolina Telephone & Telegraph Company, Tarboro, N. C., and he has long been active in USITA affairs. Mr. Hill urged that our industry continue to fight for the preservation of the free enterprise system in a free America and not give the United States of America away.

Adjournment was made at this time to permit the members to visit the exhibits of associate members of the association. They were well represented—and were ready to help

(*Please turn to page* 74)

G. Warren Schomaker has been appointed to the position of telephone credit manager for the Rochester and Atlanta areas, according to C. W. Pritchard, assistant treasurer of the Stromberg-Carlson Co., Rochester, N. Y.

Mr. Schomaker has been a sales representative for the telephone division of Stromberg-Carlson, assigned to the territory in Southern Indiana, Kentucky, and Western Tennessee for the last several years. This region will be covered by Mr. Charles E. Fogg, newly appointed sales representative.



● For styles may come and styles may go, but Koppers Poles go on and on.

Koppers Poles are famous for the way they last; for the way they give decades of dependable service; for the way they make line operation easier and more economical.

It will pay you to specify Koppers Full-Length Pressure-Creosoted Poles. You'll get the kind of pole service you like.

KOPPERS COMPANY, INC. PITTSBURGH 19, PA.

KOPPERS PRESSURE-CREOSOTED WOOD

any of the telephone men who were looking for equipment such as they had.

The banquet held at 6:30 the evening of September 18 was well attended and Master of Ceremonies, Field K. ("Smat") Smith, proved to be in excellent form, putting over his quips and introducing the entertainment in his clever way.

The second day of the convention opened Friday morning, September 19, with an address by Alvin G. Pack, president, Pack Advisers, Salt Lake City, Utah—his subject being "The World of Day After Tomorrow." Those telephone people who have their troubles today, were only too glad to lean back, relax, and hear what Mr. Pack had to say about that fascinating subject of "—Day after Tomorrow" and about the glorious future.

The concluding address of the convention was given by W. R. Jarmon, president of the General Telephone Co. of the Northwest, Spokane, Wash. His subject was: "Inflation and Toll Settlements." Mr. Jarmon has been active on the Pacific Coast Intercompany Toll Settlements Committee, made up of representatives if the industry from the states of California, Oregon and Washington, and he was well qualified to speak on the subject of "Toll Settlements."

As has been the case at previous Rocky Mountain Telephone Association conventions, the Mountain States Telephone & Telegraph Co. played host at a luncheon for the ladies on the first day of the convention. From all reports they enjoyed the luncheon and entertainment.

At their business meeting held after adjournment of the general session on September 19, 1952, a resolution was adopted by the members of the association to the effect that: since Mr. Clarence E. Johnston of the General Telephone Co. of the Northwest, passed away on June 21, 1952, after spending the great portion of his life in furthering the cause of the Independent telephone industry, and since he was intimately known by many of the members, the membership expressed its deep sorrow in his passing and their high esteem for his efforts on behalf of the Independent telephone industry.

The following officers and directors were elected to serve the Association for the ensuing year: President, Mills Roberts, General Telephone Co. of the Southwest, Hobbs, N. M.; Vice-Pres., R. A. Manuel, Browning Telephone Co., Browning, Mont.; Secy-Treas., J. W. Baker, General Telephone Co. of the Northwest, Coeur d'Alene, Idaho.

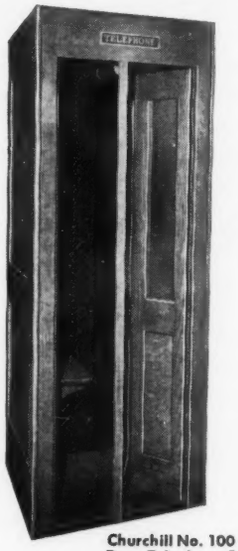
Directors: Ward W. Blazzard, Kamas-Woodland Telephone Co., Kamas, Utah; Harry Bean, Gem State Telephone Co.,, Cascade, Idaho; T. Clark Callister, Millard County Tel. & Tel. Co., Fillmore, Utah; Vincent Chiodo, Bear River Valley Telephone Co., Tremonton, Utah; J. W. Corbin, Midland Telephone Co., Moab, Utah; C. W. Haas, Home Telephone Co., Big Timber, Mont.; C. M. Hart, Citizens Utilities Co., Kingman, Ariz.; Osborne Low, Afton Telephone Co., Afton, Wyo.; D. A. McLean, Mountain States Tel. & Tel. Co., Denver, Colo.; J. F. Monsen, Aberdeen Telephone Co., Aberdeen, Idaho; Floyd L. Reyher, Haxtun Telephone Co., Haxtun, Colo.; J. F. Thiele, Pagosa Springs Telephone Co., Pagosa Springs, Colo.; J. E. Tipton, Espanola Telephone Co., Espanola, N. M.; and Sterling L. Weber, Silver Star Telephone Co., Freedom, Wyo.

Charles E. Fogg has been appointed to the position of telephone sales representative to serve in the Chicago territory, according to T. C. Thompson, telephone sales manager of the Stromberg-Carlson Co.

Mr. Fogg, formerly assistant to the chief installer, and for many years a Western Electric employee in the same capacity, will move into the field to contact operating companies in the territory previously served by G. Warren Schomaker — Southern Indiana, Kentucky, and Western Tennessee.

Construction

With the Double and America's



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Attractive—available in two finishes to harmonize with any interior. Included as standard equipment are electric light and automatic electric ventilator.

Users appreciate the comfort and privacy of a Churchill telephone booth—operating companies find it profitable.

Constructed as a single unit and equipped with reinforced back panel for mounting a wall telephone or coin collector.

No. 100-A—Selected white oak, in light medium oak satin finish.

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Overall height is 84¾"; width, 30½"; depth, 30½". Shipped knocked down and crated.

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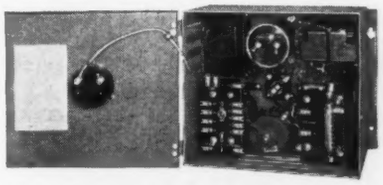
For more than a decade, leading independent telephone companies have found that Raytheon RectiFilteRs are the most economical and efficient way to supply steady DC power to PBX boards directly from an AC source.

With no moving parts, the Raytheon RectiFilteR requires neither adjustment nor maintenance. It will outlast many sets of batteries, release wires carrying charging current from central office to subscribers' PBX boards for revenue producing service, and minimize power cost because of high efficiency in converting from AC to DC.

Dry disc rectifying units and other components are designed for long-life, trouble-free service. The Raytheon RectiFilteR will end your telephone power problems. Just plug it in, close the door —and forget it!



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This protector meets all requirements of the Underwriters' specifications and is listed by the Underwriters' Laboratories.

Insulation is of high impact bakelite, and secondary surge arresters furnish high voltage protection when fuses are blown or removed.

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the modern, all-plastic, lightweight telephone cable . . .

saves three ways—

1. Lower first cost
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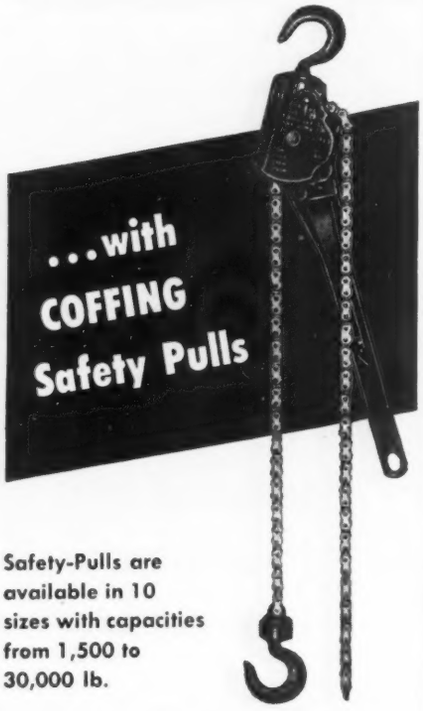

Safety-Pulls are available in 10 sizes with capacities from 1,500 to 30,000 lb.

Here are just a few of the "extras" that keep Coffing Safety-Pull Ratchet Lever Hoists on the job — and save on maintenance costs.

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- Chain is specially designed for Coffing Hoists to meet U.S. Navy specifications — and tested at 100 percent overload.
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- "Safety Valve" handle will bend before hoist is overloaded beyond maximum safe limits.
- All Safety-Pulls are factory-tested at twice their rated capacity.

Find out more about the hoists that stay on the job — and out of the repair shop. Write Dept. U11SP.

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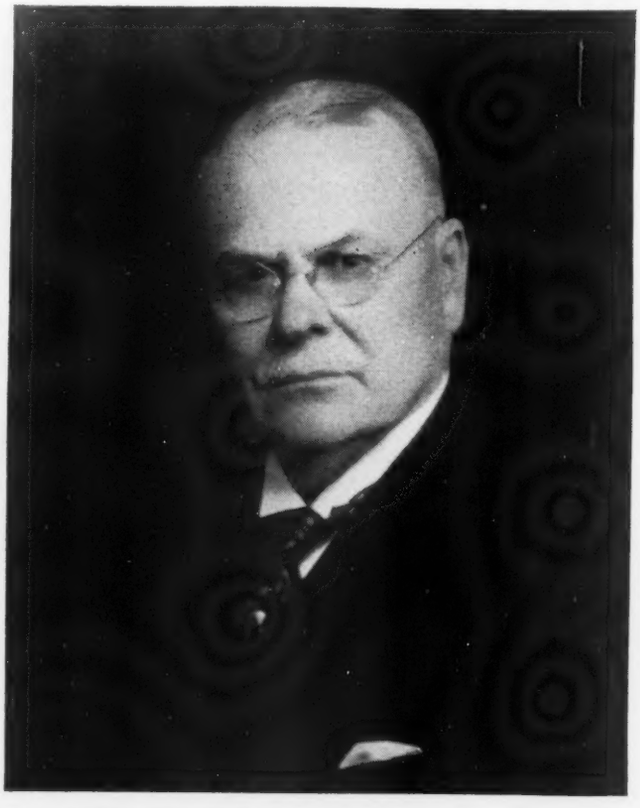
Death Takes Theodore Gary; Veteran Leader Dies Nov. 4

THE DEATH of Theodore Gary, founder of the Gary Group of telephone operating and manufacturing companies, and leader in the early development of the Independent telephone movement in the United States, brings to a close the career of one of the most forceful and influential figures in the history of the telephone industry. Mr. Gary died at his home in Macon, Missouri, early Tuesday morning, November 4, at the age of 96. Though he had retired many years earlier from the active direction of the business he founded, his interest in Independent telephony was sustained at a high level until the end.

Mr. Gary was 44 years old when, in 1900, he entered the telephone business through the purchase of small operating properties in Missouri. From that time on he was a leading figure in guiding the fortunes of the Independent segment of the telephone industry through its formative years, and later through the critical era which was marked by Bell-Independent competition. It was largely through his keen imagination and great resourcefulness that the Independents gained recognition as a leading force in the industry, and it was largely through his bold determination that the way was eventually smoothed for the elimination of competition between Independent and Bell companies, and for amicable arrangements for physical connections between exchanges of the two groups —a succession of events which gave such vitality to the telephone industry in the United States that that industry has stood ever since as one of the world's most conspicuous examples of successful and efficient private enterprise under regulation.

Born May 13, 1856, the eldest son of an Ohio farmer and house mover, Mr. Gary learned from early boyhood to face the rigors and privations of pioneer farm life. In his thirteenth year, the family moved to Missouri, eventually settling in the outskirts of Sedalia. Throughout his youth he found himself keenly conscious of his lack of formal education, and to compensate for this he engaged in personal study at every opportunity. Eighteen weeks in a country school



THEODORE GARY
1856-1952

represented the sum total of his formal training, but he grew to maturity an educated man, with a knowledge and experience which the college trained man might well envy.

Mr. Gary's early ventures in business included a partnership with a lightning rod salesman, who vanished one night leaving young Gary to settle all claims. It was symbolic of the principles which guided him throughout his career that he did not rest until all promises had been fulfilled. Later, he bought his father's moving outfit and, with a partner, set up a real estate office in Macon. As the years moved swiftly by, one business venture followed another in rapid succession. He became interested in mining, in railroads, in finance. Many of these ventures brought success, but too often the gains were cancelled out because of his determination to meet every legal and moral obligation as the changing fortunes of the times brought panic or depression.

In the late nineties, following the expiration of the early Bell telephone patents, Independent telephone companies began springing up throughout the country. One day the owner of the Independent exchange at Macon walked into Gary's real estate office to list his property for sale. As always, Mr. Gary wanted facts; and the facts about the telephone business stirred his imagination. He investigated and found other telephone properties for sale—one of them at Columbia. Mr. Gary bought the Macon property and persuaded his partner to buy the other; and they then joined forces to explore further opportunities in this new field.

It was characteristic of Mr. Gary's shrewdness that he never permitted his vision to drive him headlong into practical difficulties. He knew that the possibilities of telephone development had been scarcely scratched, but he also realized that many things had to be done both to improve telephone service and to bring its benefits within the range of people who could profitably use it. Service complaints were common; competing Bell and Independent plants in the same city were evidently uneconomic; and the Independent plants not only had no connections between them, but what was equally bad they had no connections with exchanges of the Bell system. These problems were to absorb Mr. Gary's attention for a long time to come.

The years that followed the turn of the century were in many ways years of bitter conflict and constant litigation. But through it all Theodore Gary kept always before him the ideal of two cooperating groups —the Bell System with its exchanges centered largely in the big cities and with its nationwide system of connecting toll lines; and the Independents, largely locally owned, with their own local toll lines and with lines connecting them to the Bell network. The ultimate goal was to provide service on a nationwide scale so that a telephone user anywhere, whether served from an Independent or Bell exchange, could reach any other telephone in the country. Many years were to pass before this ideal could be brought to fruition.

It had now become clear that the Independents had need for a strong association of operating companies and manufacturers to present a united front, and to help wage the fight for a plan by which the development of both Independent and Bell companies could proceed on an equitable and economic basis. There had been Independent telephone associations before this, but the crystallization of objectives now made concerted action a necessity. To this work, Mr. Gary gave unbounded energy and enthusiasm, and in 1906 largely through his efforts the International Independent Telephone Association was formed, with Mr. Gary as first vice president. The following year he was elected president and in that capacity served a year. Setting up headquarters in Chicago, he began to weld the Independents together, and at the same time began to work for commitments which would preserve the relative strength of the Independent movement in the national telephone picture. The final chapters in this story were written long afterwards, but all Independents familiar with the events of the times know how much the ultimate success of that program was due to Theodore Gary's courage, enterprise, and determination.

In the meantime Mr. Gary had expanded his initial Macon venture by the acquisition of other Independent properties serving a number of cities in Missouri and Kansas. In 1907, he organized the Theodore Gary Investment Company as a means of attracting capital for further expansion.

All through these early years, the manufacturers of equipment for the Independent companies had been steadily growing in strength and influence, and had perfected their own techniques and apparatus for improving telephone service. Among these was Automatic Electric Company, which for many years had supplied automatic telephone equipment to large numbers of Independent companies as a means of providing a grade of service which would enable them to compete successfully with Bell exchanges.

Then, at the height of the first world war, a strike crippled telephone service in Boston. Armed with an option for purchase of the Automatic company, Mr. Gary approached Theodore N. Vail, then head of the Bell System, with a proposal that Automatic be given a long term contract for the manufacture of automatic central office equipment for the Bell System. An agreement was reached, and Automatic Electric became in 1919, as it is today, the principal manufacturing unit of the Gary Group, with affiliated factories since added in Canada, Belgium, and Italy. In the years that followed other operating telephone properties were added to the original acquisition in Missouri and Kansas, and as the Independent telephone business grew, so also did the Gary Group, as soundly established operating companies were added in various parts of the United States as well as in several countries abroad.

Despite his intense pre-occupation with his telephone interests, Mr. Gary found time to engage in many pursuits of public character. One of the most exacting of these was his work as chairman of the Missouri Highway Commission, which, beginning in 1921, extended over some eight years. Under this appointment, he was charged with the task of supervising the expenditure of about one hundred million dollars for rebuilding roads throughout the state of Missouri. Thus Mr. Gary recognized the importance of communication in its broadest aspects, as embracing transport as well as message transmission. As a banker of wide acquaintance and high reputation he was also called upon to serve for a

The clean way to safeguard poles, crossarms and other wood construction is the PENTA way. This chemical formula is always the same—deep-penetrating, powerful, long-lasting. PENTA-treated poles last years longer, cost less to maintain . . . and they're *clean*. Write today for names of companies near you supplying PENTA-treated wood products.

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time as treasurer for the Republican National Committee.

But Theodore Gary will be remembered most for his singularly lovable character and the fine instincts of courtesy and delicacy that contrasted strangely with his massive personality. A living symbol of integrity, industry and courtesy, he had intolerance only for those who were greatly deficient in any of these qualities. Few men lead as full or as active a life, and there was no phase of his career—from the farm boy toiling in the fields from dawn to dusk to the head of giant enterprises stretching halfway around the globe that did not reflect the wisdom, the courage, and the generosity which were so familiar to those who knew him.

It was characteristic of Mr. Gary's entire business career that he insisted always on gathering around him men who were basically sound in character and who were capable of being trained to accept responsibility for leadership. Perhaps it is this one factor, more than any other, that has led the business he founded to ever greater areas of influence and importance in the telephone world.

Services for Theodore Gary were held at Macon, Mo., on Thursday, November 6. Surviving him are his widow, Mrs. Laurie Larrabee Gary of Macon, a daughter, Mrs. Wesley H. Loomis, Jr., of Kansas City, and four grandchildren, Theodore S. Gary, Chicago, Wesley H. Loomis, III, Kansas City, Theodore Gary Loomis, St. Louis, and Mrs. Mary Gary Harrison, Honolulu. Mr. Gary himself survived his only son, Hunter Larrabee Gary, who was closely associated with him throughout his career, and who died November 30, 1946, at the age of 62.

Motorola Announces New Weather Sensing Equipment

MOTOROLA, INC. has announced the development of a new weather sensing unit known as the "Snow Detector". This unit, designed primarily for the deicing of microwave antennas, has numerous applications.

The unit, only 7¼ inches in diameter, detects precipitation when the ambient temperature drops below 37° F. (the normal borderline temperature for snow). An integral heater melts the snow and ice collected in

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Precise in every detail . . . leg length, trim, terminals, tracer color and stay fastener . . . Runzel cords make installation a routine matter. Installers like them because they simplify their work.

Subscribers prefer Runzel cords because of clarity of reception and the longer, trouble-free service they give.

There's a Runzel cord for every type and make of instrument.

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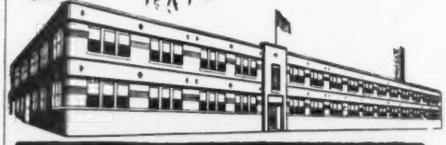
Operators too, prefer Runzel Cords.



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Cord and Wire Co.
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CHICAGO 41, ILL.

Top Secret...

High on a plateau in New Mexico, this guard is helping screen the activities of the defense-minded Sandia Corporation.

Sandia, a non-profit organization formed by Western Electric at the request of the Atomic Energy Commission, "bridges the gap between laboratory development and the manufacturing operations of atomic weapons."*

Together with the research and development facilities of the Bell Laboratories, Western Electric has been proud to answer this call to duty. We're proud, as well, of our "other job"—manufacturing quality Bell System telephone equipment that helps make the nation's telephone service the best in the world.

*A. E. C. News Release

Western Electric

A UNIT OF THE BELL SYSTEM

the "bowl". No power is consumed either by the detector or by heaters at higher temperatures. Vertical rods around the edge of the unit prevent birds from nesting in the detector.

Fully automatic, the detector will turn on heating elements whenever icing conditions exist. Up to 30 amperes at 117 volts AC can be switched without external relays. The heaters will then remain on until the icing hazard is past, being automatically turned off by the detector.

Economy of operation, reliability, full protection from adverse weather conditions and automatic control characterize this new product.

Cook Electric Enlarges Staff of Wirecom Div'n.

J. A. KULL, M. W. Whitney, and R. D. Friehe have been added to the staff of Cook Electric Company's Wirecom Division.

Jack Kull was formerly in charge of the company's subcontracting activities and was previously employed as general purchasing agent of an associated group including: American Well Works, Challenge Company, Atlas Foundry, Anbar Foundry, and Automotive Mufflers, Inc.

Bill Whitney served as communications officer in the Marine Corps and prior to employment by Cook Electric was inspector for the Signal Corps.

Dick Friehe was in charge of expediting Cook Electric Company's purchases. These appointments have been made to accommodate the Wirecom Division's expansion program.

National Planning Assoc. Honors Robert C. Tait

ROBERT C. TAIT, president of the Stromberg-Carlson Co. of Rochester, has been appointed Chairman of the Finance Campaign of the National Planning Association.

The appointment was announced recently by H. Christian Sonne, Chairman of the association's Board of Trustees. The announcement included a statement of aims of the NPA, which since 1934 has conducted scores of effective programs through "joint planning of the nation's future" by active leaders in business, agriculture, labor, and the professions.

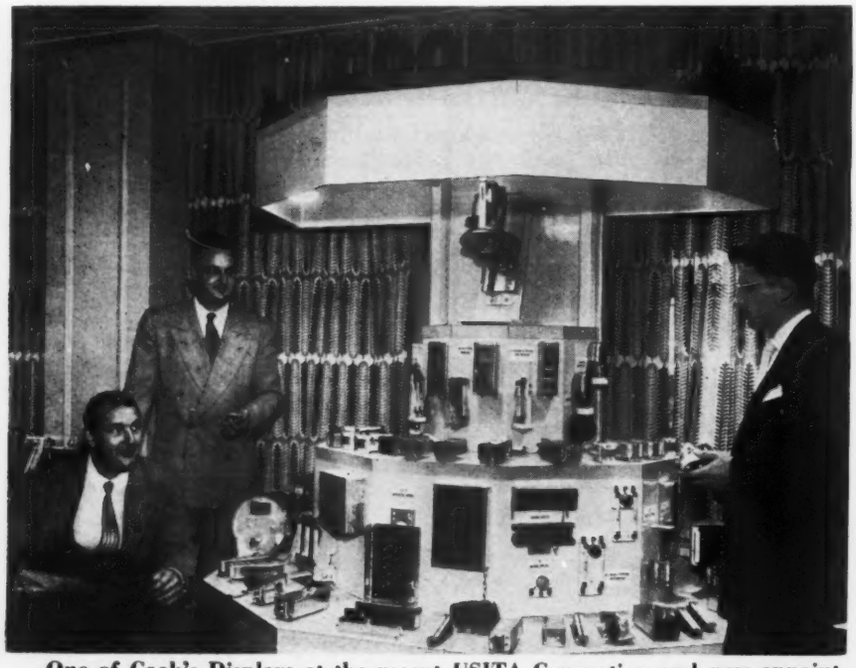
Mr. Tait was prominently identified with banking activities in Pennsylvania and New York before his association with Stromberg-Carlson.

In accepting the appointment, Mr. Tait said:

"I am convinced that the need is greater than ever before for long-range, joint planning by the practical leaders of business, labor and agriculture, following the technique of the National Planning Association that has been so spectacularly successful in the past.

"To meet the great need, the NPA

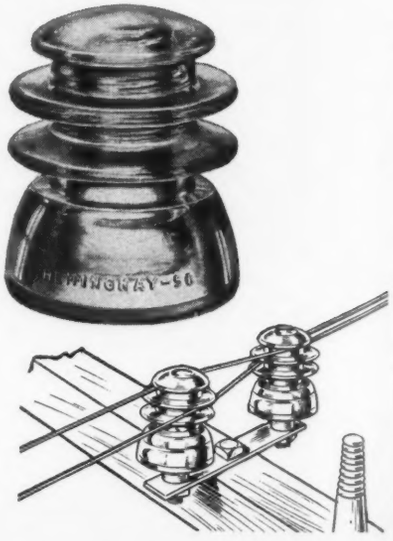
(*Please turn to page* 82)



One of Cook's Displays at the recent USITA Convention and new appointments (reading left to right) M. W. Whitney, R. D. Friehe, J. A. Kull.

Construction N
With the Double
and America's

number 56...
low cost, but with the high standards of all hemingray insulators



Hemingray's popular "Number 53" now has a new, lower-priced companion—Number 56. Like its larger counterpart, "56," when used in point transpositions, requires no special hardware and goes on standard pins.

Tested by the A.S.T.M. (method D-468-42), it meets the product specifications of utility companies and maintains the high level of quality which has made all Hemingray insulators a standard in the communication industry.

Packed: 40 to a carton, weighing 59 lbs.

Manufactured by American Structural Products Company

STROMBERG Telephone CARLSON

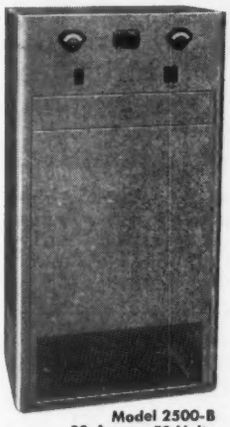
TELEPHONES, SWITCHBOARDS • SOUND

n Materials and Supplies . . .

Guarantee of Stromberg-Carlson Leading Manufacturers . . .

for 3-phase operation . . . be safer and surer with

flotrol automatic battery charger



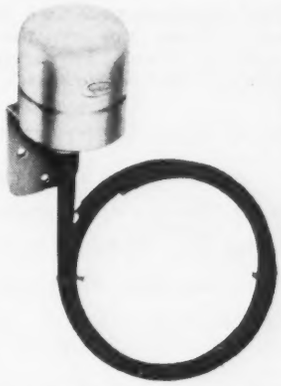
Model 2500-B
50 Amps., 50 Volts

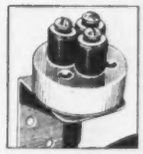
Except for the starting and battery disconnect contactors, the FLOTROL does not contain any moving parts—an assurance of higher efficiency, complete dependability and longer service life. All components are in one cabinet and no special foundations are needed, reducing installation to a minimum. DC voltage delivered is regulated within ± 1%. Complete overload protection is as automatic as charging itself.

WRITE for Bulletin 161—completely describing the FLOTROL system for 3-phase operation.

cook hi-cap power cross protector

a heavy-duty arrester for fault currents . . .





Unit with alloy cover removed to show porcelain base and position of carbon electrodes.

In the event of contact between power and communication circuits, the Cook HI-CAP carries the fault current long enough to allow the power breakers to operate and de-energize the power circuit.

Certified tests show that the current carrying capacity of the HI-CAP is in excess of 750 DC Amps. for three seconds; 550 DC Amps. for four seconds, and 400 DC Amps. for five seconds. These protectors can be spaced along exposed lines to provide desirable lightning protection.

The Cook HI-CAP Power Cross Protector has three carbon electrodes with fusible elements which melt and further reduce the impedence of the fault current path when the fault current continues over a long period. They are easy to mount on poles or crossarms.

Mfd. by Cook Electric Co.

the new "1400" series Stromberg-Carlson telephone

comes in 7 assorted "styles"!

There's not a need in telephony which the "1400" series hasn't foreseen—and met! Adaptable as desk set or wall phone—for manual or dial use—and can be used with practically any current American made dial. Ask for complete descriptive brochure.

Distributed by STROMBERG-CARLSON

ROCHESTER 3, NEW YORK

"Texas Best" Pressure Creosoted Southern Pine Fence Posts—that's the way the order read. Sure, everything is bigger and better in Texas, but even the folks at Lone Star Creosoting Co. in Longview were a little surprised when Penry Lumber Co. of Fort Worth, Texas, sent in an order calling for 15-inch top diameter 7-foot posts. It required only about 45 posts to make a truckload. The folks at Penry Lumber Co. got the posts, however, as the photograph shows.

has designed a program of research and analysis of the important problems of the day. This expanded program of public education will prove of vital benefit to every citizen."

A. F. Adams Honored By Italian Government

A. F. Adams, chairman of Automatic Electric Co. and executive head of the Gary Group of telephone manufacturing and operating companies, was honored by the Italian government on Wednesday, October 29, when he received the Stella della Solidarieta Italiana (Star of Italian Solidarity). This decoration was

These Bonds have not been and are not being offered to the public.
This advertisement appears as a matter of record only.

NEW ISSUE

$5,000,000

Rochester Telephone Corporation

First Mortgage 3½% Bonds, Series B

Due October 1, 1987

Direct placement of the above Bonds has been negotiated by the undersigned.

The First Boston Corporation

NEW YORK BOSTON PITTSBURGH CHICAGO
PHILADELPHIA CLEVELAND SAN FRANCISCO

November 6, 1952.

given to Mr. Adams because of his participation over many years in Italian communications and in the reconstruction in Italy since the war. The decoration is reserved for those who have participated in a notable way in the reconstruction of Italy since the war.

The decoration was presented in New York City on behalf of the Italian government by His Excellency Guiseppe Spataro, Minister of Posts and Telecommunications, accompanied by the Italian Consul General in New York, Baron Carlo de Ferrariis Salzano. The minister with a delegation of Italian telecommunication experts has been studying the latest advances in the telephone, radio and television arts in the United States. The minister and his delegation were guests of the United States Independent Telephone Association during the recent convention in Chicago.

During his visit, the minister stated that Italy is now in process of enlarging and developing a communications network to meet the demands of the people and that the backlog of unfilled applications for telephone service runs into the hundreds of thousands. Automatic Electric Company's manufacturing affiliate in Italy, Autelco Mediterranea, S.A.T.A.P., Milan, has supplied much of the new automatic telephone equipment installed in Italy since the war.

New Booklets On Soldering Terminal Films

TWO NEW illustrated booklets which present the highlights of the industrial films, "All's Well That Ends Well" and "By the Millions" have just been published by Aircraft-Marine Products, Inc., Harrisburg, Pa., manufacturer of solderless terminals.

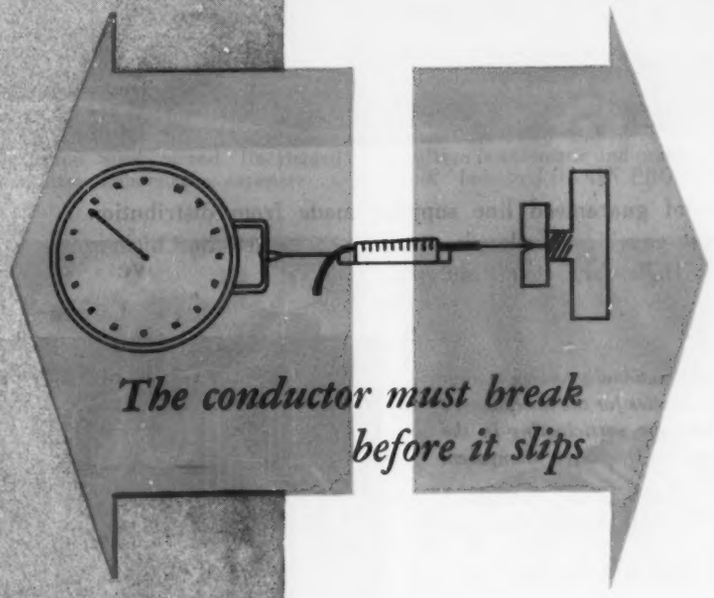
These pocket-size books are intended primarily for distribution to audiences preceding the showing of the films. However, they are also useful and informative in their own right. "All's Well That Ends Well" demonstrates the use and application of solderless terminals with precision hand tools. "By the Millions" shows how solderless terminals in strips fed from reels can be applied to wire at rates of up to 4000 per hour with automatic machines.

These booklets and films have been

(*Please turn to page* 86)

ALPHADUCT

P clamp adhesion test



P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

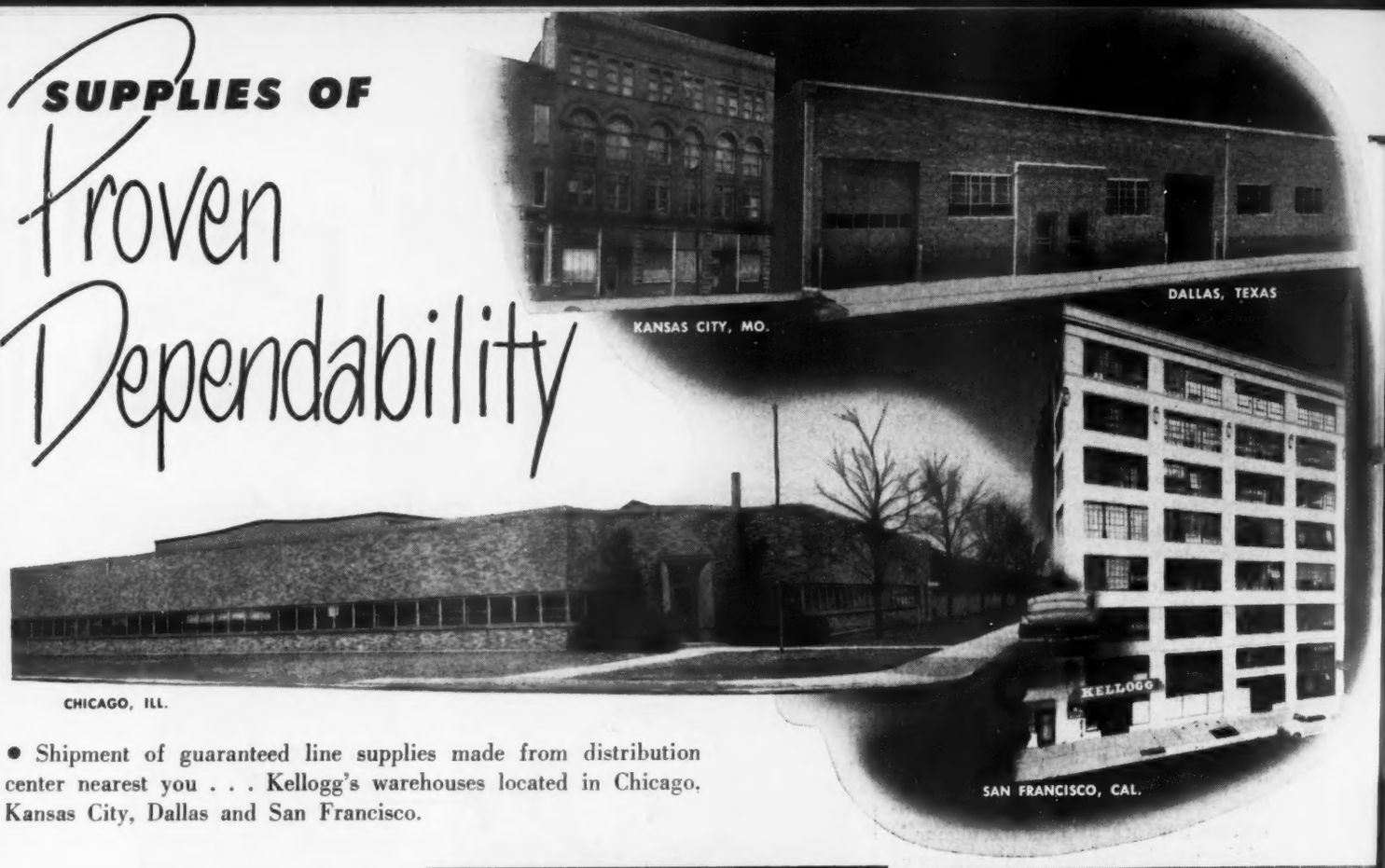
A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY • MILLTOWN, NEW JERSEY
NATIONAL DISTRIBUTORS • LEICH SALES CORPORATION, CHICAGO, ILLINOIS
REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

SUPPLIES OF Proven Dependability



• Shipment of guaranteed line supplies made from distribution center nearest you . . . Kellogg's warehouses located in Chicago, Kansas City, Dallas and San Francisco.

The following nationally-known manufacturers of supplies for the independent telephone field are participating in the 1952 Kellogg Co-Operative Campaign.

American Creosote Works, Inc.

American Structural Products Co.

Ansonia Electrical Company

Bishop Manufacturing Corp.

Boston Woven Hose and Rubber Company

Churchill Cabinet Company

Continental Cross-Arm Co.

Cook Electric Company

Copperweld Steel Company

The Electric Storage Battery Co.

General Insulated Wire Works, Inc.

Gould-National Battery Inc.

W. A. Hammond Drierite Company

Indiana Steel & Wire Company

Kester Solder Company

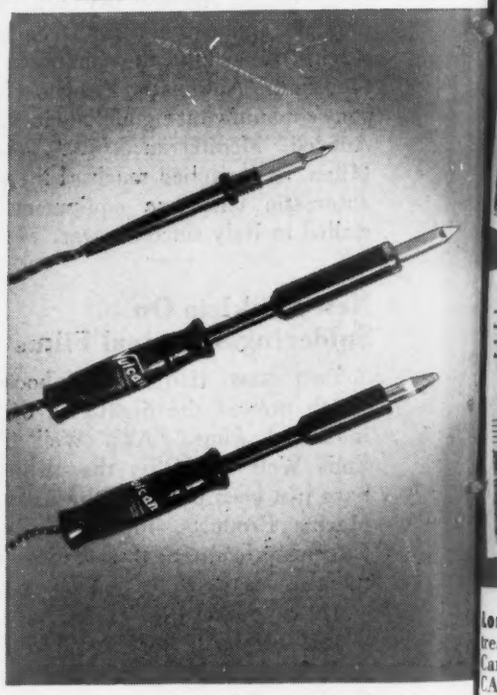
Lorain Products Corporation

T. J. Moss Tie Company

National Carbon Company
A Division of Union Carbide and Carbon Corporation

National Telephone Supply Co.

Reliable-Economical! "Eveready" "Columbia" "Gray Label" telephone dry cells give you dependability, plus economy thru higher sustained voltage and extra service life. Made by NATIONAL CARBON COMPANY, a Division of Union Carbide and Carbon Corporation.



You'll Find Soldering Is Easy . . . workmanship neater with famous Vulcan Soldering Irons. Available in five sizes—either plug or screw tip. The high-powered heating element assures even proper heat and long satisfying service. Made by VULCAN ELECTRIC COMPANY.

Newman Manufacturing Company

Paragon Electric Company

Ray-O-Vac Company

Raytheon Manufacturing Co.

Reliable Electric Company

M. M. Rhodes & Sons Company

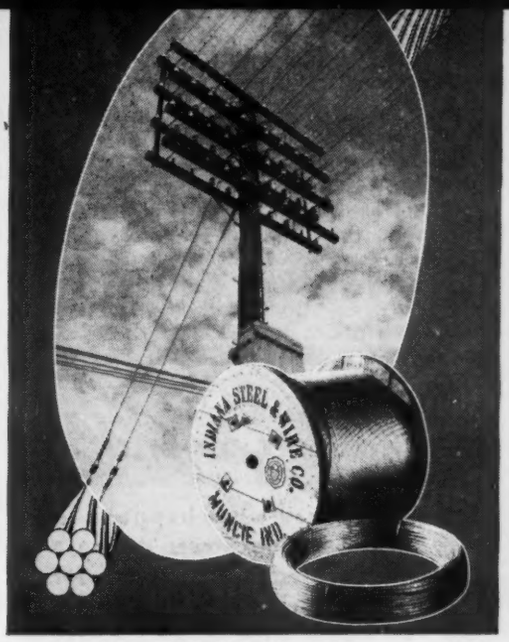
Schauer Manufacturing Corp.

Taca Cable Stripper Manufacturing Co.

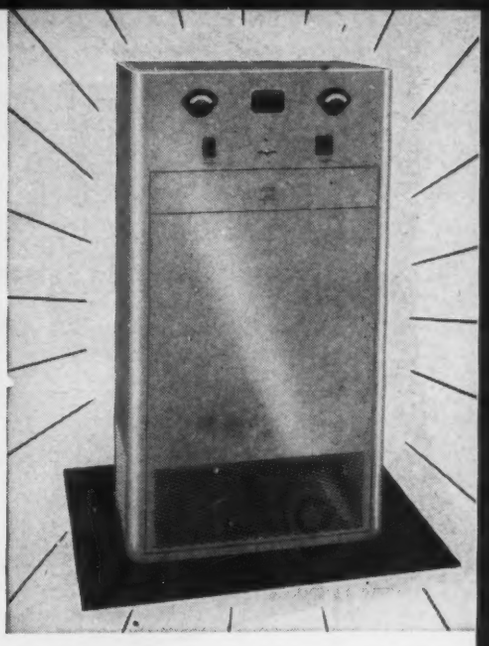
Vulcan Electric Company

Weller Electric Corp.

Cut "Trouble Shooting" Expense!—Install PARAGON ELECTRIC COMPANY'S top quality drop wire. Great tensile strength, high conductivity, and perfect adhesion are some of its outstanding qualities. This drop wire is available in Copperweld or High Tensile BB Bronze.

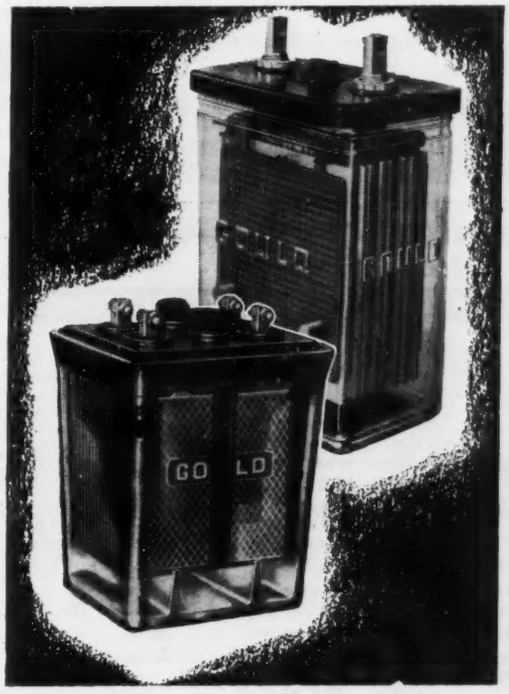


The Time-Tested Steel Strand. A ductile, adherent zinc coating applied by the famous Crapo Galvanizing Process, provides lasting protection against corrosion in INDIANA STEEL & WIRE CO. Crapo Steel Strand. Its rugged strength minimizes maintenance expenses.



It Regulates—it Compensates. Flotrol Battery Chargers assure continuous power savings by low standby losses combined with high overall efficiency. Compensation for variation in input voltage is automatic and practically instantaneous. Made by LORAIN PRODUCTS CORP.

Long Life Expectancy is built into pressure-treated Southern Pine Poles and Crossarms. Carefully and thoroughly treated by AMERICAN CREOSOTE WORKS, INC., these poles have extra durability required for dependable service under the toughest climatic conditions.



Your Battery Problems Are Solved when you put Gould Planté and Floté Batteries to work. Unique features of design cut maintenance and charging costs, lengthen life and reduce replacements. Made by GOULD-NATIONAL BATTERIES, INC., a leader in their field.

Tape that works with you—Bull Dog Friction Tape—product of BOSTON WOVEN HOSE & RUBBER COMPANY. This tape grabs fast, holds tight. Doesn't ravel or fray . . . goes on without wrinkling. Stays fresh in the roll and on the job. Remains usable longer.

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An IT&T Associate

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ONAN Emergency Electric Plants for Civil Defense

No matter what happens to central station power during a bombing attack, electricity for essential defense needs is always available with Onan Electric Plants. Onan units, mounted on truck or trailer, or carried in the trunk of a car, can be rushed to any point where power and light are needed. Sturdy and dependable, Onan Electric Plants are an important link in a city's defense against disasters of any kind.

Power & Light for Every Need

Portable, Mobile, or Stationary
400 to 35,000 watts. A.C. or D.C. models.

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Onan PRODUCTS

D. W. ONAN & SONS INC.

7566 UNIVERSITY AVE., MINNEAPOLIS, MINN

DO THOSE PLOWED-FIELD JOBS THIS WINTER
While the ground is frozen!

NO CROP DAMAGE • NO MUD • BETTER PUBLIC RELATIONS

PENGO EARTH AUGERS

★ Twin helix—no back thrust!
★ Bores true, clean holes in any soil, most sandstones and hardpans, frozen ground, permafrost!
★ All wearing parts replaceable on job!
★ Made in 15 sizes, 10" to 54" hole diameters, to fit all makes of heavy-duty earth boring machines. Larger sizes on order.

PENGO CUTTING HEADS

★ Easy installation — welds to your present helix.
★ Bores where you never could before!
★ Wearing parts replaceable on the job, interchangeable with PENGO Auger parts.
★ Made in 9 sizes, 8" to 24" diameters. Larger sizes on order.

PENGO ANCHOR AUGERS

Specially designed to bore holes for expanding anchors. 3-flight helix carries dirt out fast — completes hole with half the usual trips down and up! In 9", 11" and 13" sizes for 8", 10" and 12" anchors. Parts and features same as PENGO Augers.

PENGO BUCKET CUTTERS

Fast-digging PENGO Auger helix to weld to your present bucket bottom hinge. Available for buckets 16" through 36" in diameter. Offers same money-saving features as PENGO Augers.

"Get the PENGO WISDOM TOOTH*

It knows how to bore holes"

Quick-replaceable, drive-on *PENGO Wisdom Teeth are cast from special abrasion and shock-resistant steel alloy; give far longer service life! Used on all PENGO Augers and Cutting Heads.

ORDER NOW. SEND FOR LITERATURE: PRICES

PETERSEN ENGINEERING CO.
Manufacturers
Santa Clara, California

(Continued from page 83)

prepared for distribution and presentation before meetings of scientific and technical societies, trade associations, industrial groups and engineering and technical schools, as well as customers and prospects.

Requests for copies of the booklets and for further details regarding the films will receive prompt attention if addressed to Aircraft-Marine Products, Inc., 2100 Paxton Street, Harrisburg, Pa.

Reilly Tar Pres. Honored By Earlham College

CARLETON B. EDWARDS, president, Reilly Tar & Chemical Corp., recently received a citation in the field of business from Earlham College, Richmond, Ind. The citation was one of 20 bestowed on outstanding Earlham alumni for notable records in their professions and for public service

Statement of the Ownership, Management, and Circulation Required by the Acts of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233)
of Telephone Engineer & Management, published monthly at Pontiac, Illinois, for October 1, 1952.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

Editor—Ray W. Smith, 7720 Sheridan Road, Chicago, Ill.

Managing Editor—John G. Reynolds, 7720 Sheridan Road, Chicago, Ill.

Business Managers, Ray W. & Roy F. Smith, 7720 Sheridan Road, Chicago, Ill.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Telephone Engineer Publishing Corporation, 7720 Sheridan Road, Chicago 26, Ill.

Ray W. Smith, 7720 Sheridan Road, Chicago 26, Ill.

Roy W. Smith, 7720 Sheridan Road, Chicago 26, Ill.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

Ray W. Smith, 7720 Sheridan Road, Chicago 26, Ill.

Roy F. Smith, 7720 Sheridan Road, Chicago 26, Ill.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do no tappear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

Ray W. Smith, Editor

Sworn to and subscribed before me this 1st day of October, 1952.

Virginia McCollum

(My commission expires August 27, 1955)

that has reflected honor on their college. He was graduated from Earlham in 1915 and is secretary of the Earlham Foundation.

Mr. Edwards, before joining Reilly Tar & Chemical Corp., served as head of the chemistry department of Guilford College. He has been with Reilly Tar & Chemical Corp. for 31 years. Starting as a Research Chemist, he advanced to director of research, production manager, and was general manager for the past 10 years before being elected president this year.

Merle W. DeWees Named Ansonia Sales Mgr.

THE ANSONIA Electrical Co. has announced the appointment of Merle W. DeWees as sales manager of the company, effective Nov. 17, 1952.

According to A. P. Lunt, president of the company, Mr. DeWees, while not previously connected with the wire and cable industry, brings to the concern a wealth of experience in many phases of municipal, state and federal government business fields as well as practical general sales experience.

Mr. DeWees was most recently executive director of The New Haven Taxpayers Council of New Haven, Conn.

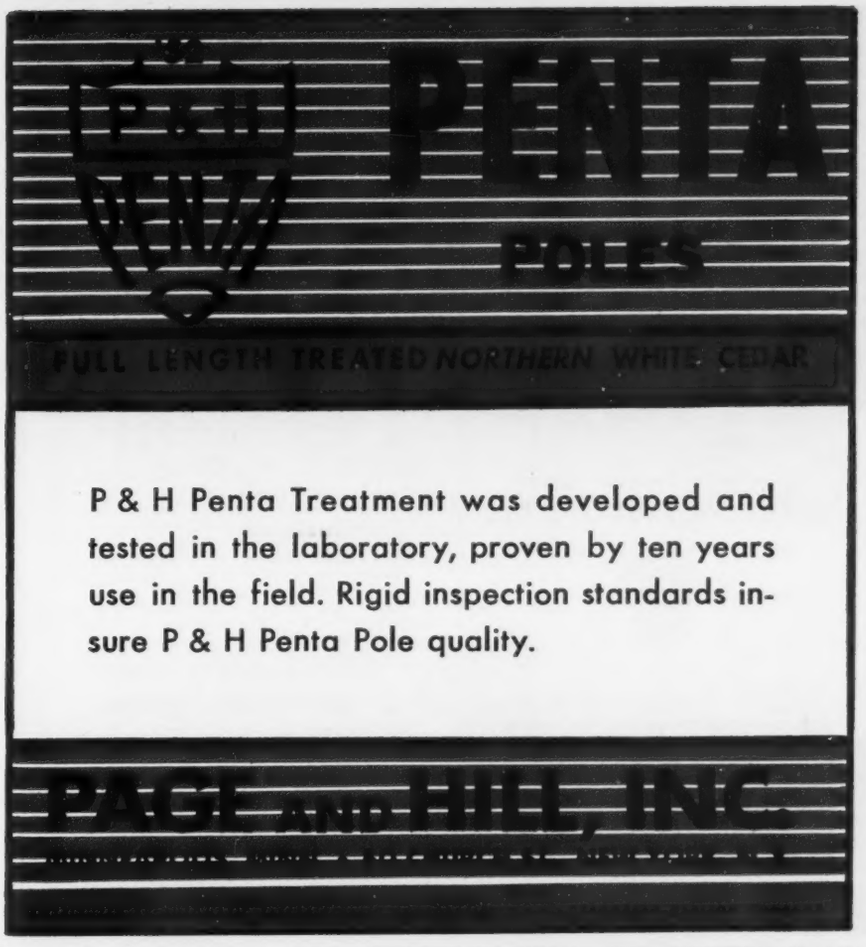
Rugged Acrylic Plastic Now Glazes 'Sno-Cats'

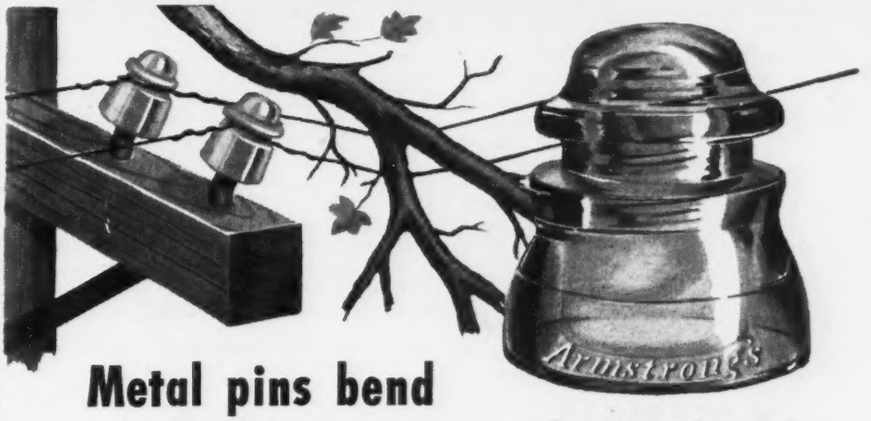
ADOPTION OF the acrylic plastic Plexiglas for side and rear windows of "Sno-Cats," the widely known vehicles used wherever off-the-road travel is essential in heavy snow, represents one of the more exacting applications of this sheet material.

These vehicles, some models of which use four crawler-equipped pontoons, are employed in some of the wildest parts of the country by utilities, mining and lumbering firms, government agencies, ski resorts, and by search-and-rescue teams in the event of plane crashes. In such operations, naturally, windows get rough treatment as work crews stow their equipment and slam doors. Also, windows are constantly being struck by branches, and are often exposed to temperatures far below zero. Breakage of windows in such conditions would mean intense discomfort and possible danger to occupants.

Accordingly, the Tucker Sno-Cat Corp., Medford, Ore., engaged in the

(*Please turn to page* 91)


NEW
PENTA
POLES
FULL LENGTH TREATED NORTHERN WHITE CEDAR
P & H Penta Treatment was developed and tested in the laboratory, proven by ten years use in the field. Rigid inspection standards insure P & H Penta Pole quality.
PAGE AND HILL, INC.



Metal pins bend before these insulators break

You can reduce breakage on your lines with Armstrong's Glass Insulators. These rugged insulators safely support long heavy spans and stand up under strains that can bend standard metal mounting pins.

Armstrong's Insulators are molded of tough industrial glass to resist weathering and surface leakage. They'll also withstand thermal shocks more severe than any met in service. Uniform thread contour prevents rocking and wobbling on the pins. And linemen like these smooth, safe-to-handle seams.

Get further information from your supplier or write Armstrong Cork Co., Glass and Closure Division, 295 Fifth Ave., New York 16, N. Y.

ARMSTRONG'S GLASS INSULATORS

for communications . . . for power

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For the Convenience of readers of Telephone Engineer

Attention

CABLE SPLICERS

Opportunity for first class Cable Splicers.

Jobs open at top wage scales with vacation and Holiday pay.

Also extra incentive pay plan.

If qualified—

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BUSINESS OPPORTUNITY for aggressive individual willing to make investment and assume complete charge of setting up sales force for young and growing telephone supply company. Furnish education, experience and personal information in reply to box 8782, Telephone Engineer Publishing Corp.

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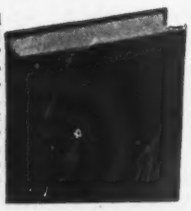
MATERIALS HANDBOOK

By GEORGE S. BRADY

879 pages, 6x9, $8.50

Save time, trouble, and error in looking up and choosing materials for manufacturing, construction, engineering, chemical processing, etc. Years in preparation; book gives you most useful facts on properties, etc. for thousands of materials in simple, compact form.



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TELEPHONE ENGINEER PUBLISHING CORP.

7720 Sheridan Road Chicago 36, Ill.

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Jobs immediately available with rapidly growing telephone company. Steady employment with excellent opportunities for advancement for capable linemen, cable splicers, splicer's helpers and combination men. Also, technicians with Microwave operating experience possessing first or second class FCC license, particularly someone capable of assisting with outside telephone plant engineering collaterally.

Replies are strictly confidential and should include details of experience, objectives and availability.

Citizens Utilities Company of Northern California

1255 Oregon Street Redding, California

HELP WANTED—Cable Splicer and Combination Men—Opening for qualified journeymen — permanent position, good working conditions, employees benefit plan, opportunity for advancement. Replies should include details of past employment and experience. Write South Carolina Continental Telephone Company, Sumter, South Carolina.

CENTRAL OFFICE PERSONNEL experienced with Strowger and manual equipment. Employment affords opportunity for early advancement. Replies are strictly confidential and should include details of experience, objectives, etc. Write the Union Telephone Company, Owosso, Michigan.

USE TELEPHONE ENGINEER AND MANAGEMENT'S CLEARING HOUSE
To locate workers—jobs—merchandise. A small ad covers the field.

TRAFFIC SUPERVISOR — Class A telephone company operating approximately 33,000 stations located in the Middle West. Must have experience in Manual and Automatic Central Office and have capacity to train and direct personnel in all phases of traffic work. Write giving background and experience to Box 8799, c/o Telephone Engineer.

HELP WANTED—MANUAL Central Office Equipment Installers and Dial or Manual Central Office Repairmen wanted. Supervisory and non-supervisory positions open. Attractive salary, working conditions, pension plan and other benefits. Excellent opportunity for advancement. State age, experience and send small photograph. General Telephone Company of Illinois, Illinois Building, Springfield.

WANTED—Salesman to cover Missouri and Kansas for telephone supply house on commission basis. Car furnished. Box 8783, Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

For Best Results Advertise in Telephone Engineer & Management

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Formed-flexible finishing cloths (Patented); Flat finishing cloths; Catch cloths; Crotch cloths and Up-right joint catch cloths. Made of world-prize HERRINGBONE TICKING or imported English MOLESKIN. If your jobber cannot supply you write us for literature and prices.

GEO. E. WILLIAMS, *Mfr.*

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IF YOU WANT TO—

—buy an exchange

—sell a telephone exchange

—hire a new employee

—buy used equipment

—sell used equipment

—secure a better position

—let your desires be known through a low cost CLASSIFIED AD in FORTNIGHTLY TELEPHONE ENGINEER.

Rates are reasonable — 15 cents a word, except for Situation Wanted Ads, which are only 5 cents a word. In figuring cost of ads, count each word of address in number of words used. Minimum charge $2.00. Special rates for Display type ads on request.

If you wish replies to your ad to be addressed to FORTNIGHTLY TELEPHONE ENGINEER, count blind address as 4 words. All ads payable on order. Discount of 25% is allowed on ads ordered for 4 or more times: for example—

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(Continued from page 87)

manufacture of the vehicles for more than 25 years, has adopted shatter-resistant Plexiglas for its sliding side windows and for the large window in the hinged rear doors. In these applications, the acrylic sheet has demonstrated its ability to withstand the twisting stresses set up in window and door frames as the Sno-Cats negotiate rough terrain. The plastic panels are .150 inches thick. The light weight of this material (slightly less than half than that of glass) is helpful because the performance of these vehicles in deep snow is based on a combination of lightness and great tractive surface. This design permits the Sno-Cat, equipped with four pontoons, to climb 65 per cent grades in snow, and to carry a load of men and equipment with a pressure considerably less than one pound per square inch. As a result, they sink into snow less deeply than does a man on skis.

New Carrier System For Radio Applications

UP TO 24 broad-band voice channels can be transmitted over a wide-band radio channel with the new Lenkurt Type 33C carrier telephone system.

Designed specifically for application to radio links, this frequency division multiplex system is comprised of three eight channel groups. A single group or less can be installed initially and expanded to the maximum capacity in the future as traffic increases.

A full 24 channel Type 33C can be used with any radio system which has adequate power levels and is capable of transmitting signals up to 135 kc. Less than 24 channels can be used with radio systems which have less usable bandwidth. The frequency division, single sideband method of operation lends itself readily to dropping or inserting channels at intermediate repeater points on the radio system.

A number of innovations have been made in the mechanical and circuit design of Type 33C equipment.

Because the problem of channel coordination common to wire line carrier operation does not apply to radio operation, the channels have been spaced at 5 kc intervals. Two frequency allocations are available; one uses frequencies up to 135 kc,

(*Please turn to page* 93)

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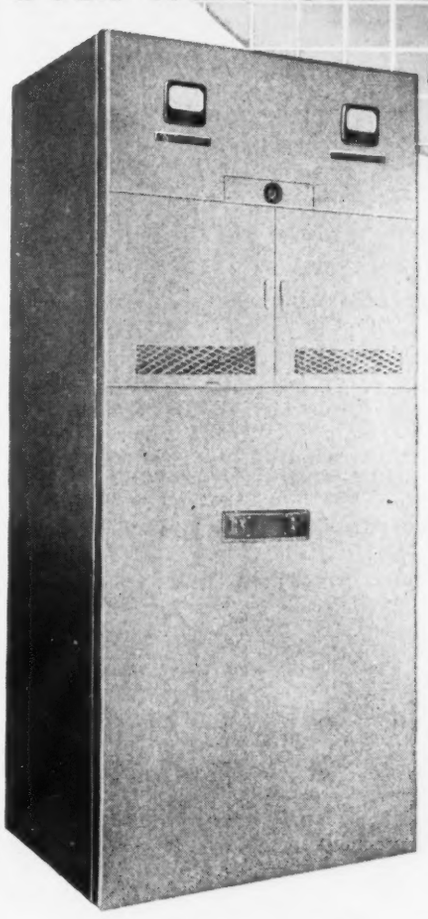
OVER WIDE LOAD RANGE WITH PECO BATTERY CHARGERS



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- Reduced stand-by power consumption
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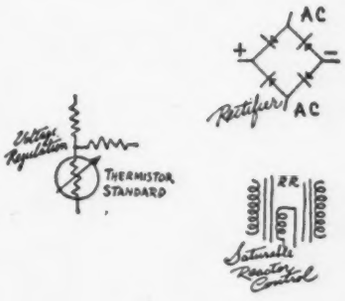

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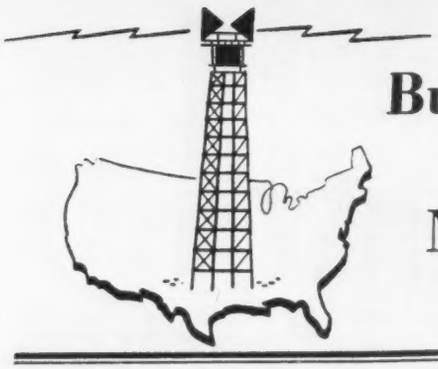


The Buyers' Directory *and* New Products' Showcase

ADVERTISING, Directories—General Telephone Directory Co., 604 Pine Ave., Long Beach, Calif., and 185 N. Wabash, Chicago, Ill.—[ADV. 1]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.—[ADV. 2]

BELTS — CLIMBERS — PLIERS — SAFETY STRAPS—CONSTRUCTION TOOLS. Klein & Sons, Mathias, 3200 Belmont Ave., Chicago 18, Ill.—[ADV. 3]

BOOTHS—Acoustic Telephone—Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.—[ADV. 4]

BRUSH & WEED KILLERS—Thompson manufactures many types of brush and weed killers. Write for helpful information on specific problems. Thompson Chemicals Corp., St. Louis 3, Mo.—[ADV. 5]

CABLE, All Plastic, Aerial, Duct, Direct Burial, PBX, Switchboard.—The Ansonia Electrical Co., Ansonia, Conn.—[ADV. 6]

CORDS, Switchboard, Instrument and Operators—Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.—[ADV. 7]

CORDS, Switchboard & Telephone—Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.—[ADV. 8]

ELECTRIC HOT WATER HEATERS. Thermostatically controlled for any hot water heater, Vulcan Electric Co., Danvers 17, Mass.—[ADV. 9]

FURNACES—For quickly and economically melting lead and paraffin—Mutual Liquid Gas Equipment Co., Inc., 3600 W. Imperial Highway, Los Angeles, Calif.—[ADV. 10]

INSULATORS, Porcelain—Porcelain Products Inc., Box 300, Findlay, Ohio.—[ADV. 11]

LIGHTWEIGHT PULLERS—Coffing Hoist Company, 800 Walters St., Danville 5, Ill.—[ADV. 12]

PIPE PUSHERS—Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.—[ADV. 13]

POLE HOLE DIGGERS—For derrick mounted trucks. Tele-E-Lect Products, Inc., 9613 Minnetonka Blvd., Minneapolis 16, Minn.—[ADV. 14]

POLES, Southern Yellow Pine—Colfax Lumber & Creosoting Co., Inc., P.O. Box 23, Pineville, La.—[ADV. 15]

POLES, Southern Yellow Pine—Taylor Colquitt Company, 290 E. Main St., Spartanburgh, S. C.—[ADV. 16]

POLES, Southern Yellow Pine—Texas Creosoting Co., Orange, Texas.—[ADV. 17]

PROTECTIVE EQUIPMENT—Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.—[ADV. 18]

REBUILT TELEPHONE & SWITCHBOARDS—Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 2, Ill.—[ADV. 19]

TRUCK BODIES—Highway Trailer Co., Edgerton, Wisc.—[ADV. 20]

WIRE DROP & INSIDE—Jackets of neoprene, rubber or plastic. Lowell Insulated Wire Co., Lowell, Mass.—[ADV. 21]

WIRE, Insulated—DATED DROP WIRE—Neoprene or Weatherproof—Alphaduct Wire & Cable Co., Milltown, N. J.—[ADV. 22]

WIRE, Insulated Drop and Bronze or Copperweld—Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.—[ADV. 23]

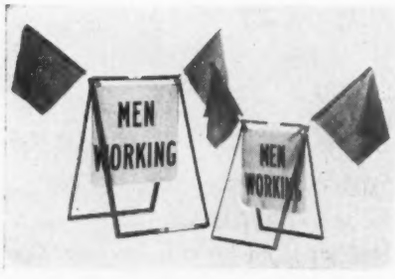
WIRE, Insulated Drop, Genuine Ironite—Paragon Electric Co., Two Rivers, Wis.—[ADV. 24]

NEW OSCILLATOR

A new portable oscillator, designed as a source of signal power for field use, has been announced by the Southwestern Industrial Electronics Co. The Model "MB-1" Oscillator derives its operating power entirely from self-contained batteries and covers a frequency range of 2 to 20,000 cps in 4 decade ranges. An output voltage of 5.5 volts is delivered to a 2,000 ohm load, and the instrument has an internal impedance of approx. 400 ohms.

Distortion is less than 1% in the audio spectrum, and the dial is accurate to within 2% of its indication. The unit is equipped with a switch which decreases the battery gain when the full output is not required, and thereby increases battery life to 100 hours or more for intermittent service.—Check New Product 456.

For Quick Information on any product shown on these pages use the handy coupon shown below.



MODERN WARNING STAND

New Senior-Size "A" Stand is the latest warning sign for safety at approaches to work areas. Highway superintendents asked for an extra-large warning sign, because regular "Men Working" stands often are not visible to bus drivers and cab truck operators.

Responding to this demand, Eastern Metal, Elmira, Inc., now offers a heavier and larger 38-in. high Senior-Size "A" Stand for greater visibility. The same popular features of Eastern's 27-in. Regular "A" Stand are incorporated in the new Senior "A" Stand. It is compact, light-weight, easy to store, quickly assembled, holds two warning flags, and will not blow over in heavy winds or backwash of passing traffic.—For complete information Check New Product 455.

SEND IN THIS COUPON FOR MORE INFORMATION

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Please forward complete information on the following products and services described in the November, 1952 issue of TELEPHONE ENGINEER & MANAGEMENT (Check information desired.)

NEW PRODUCTS

NP 455..... NP 456.....

SERVICES AND SUPPLIES

ADV. 1..... ADV. 2..... ADV. 3..... ADV. 4..... ADV. 5..... ADV. 6.....
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ADV. 13..... ADV. 14..... ADV. 15..... ADV. 16..... ADV. 17..... ADV. 18.....
ADV. 19..... ADV. 20..... ADV. 21..... ADV. 22..... ADV. 23..... ADV. 24.....

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Company .....

Street Address .....

Town ..... Zone..... State.....

and the other uses frequencies up to 150 kc. Each channel includes a broad speech band of approximately 300 to 3400 cycles with provision for out-of-band signaling at 3.9 kc.

With the exception of a group positioning panel, each eight channel group uses identical channel equipment. Unitized construction is used throughout to conserve space and simplify production.

These and other features provide a high quality carrier system at a lower cost than otherwise possible.

Complete information about the new 33C telephone carrier system can be obtained from the Lenkurt Electric Co., 1141 County Road, San Carlos, Calif.

Announces New Series of Exide-Manchex Batteries

GREATER economies resulting from lower initial cost, increased efficiency and long, trouble-free life are among the outstanding advantages claimed for the new series of Exide-Manchex batteries in transparent plastic containers announced by The Electric Storage Battery Co.

Known as Type CME, they are available in both two-cell and three-cell units built to meet the most rigorous service demands in stationary small power applications.

In designing the CME line, Exide engineers have succeeded not only in reducing weight per ampere-hour output but also in decreasing over-all size of the units, thus making possible appreciable savings in installation space.

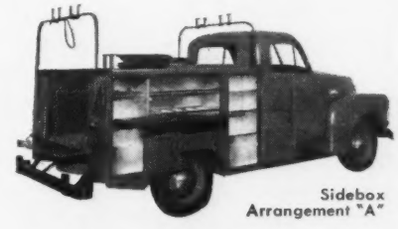
Other user benefits attributed to the new batteries are unsurpassed dependability for the most vital applications, low operating and maintenance costs, greater watt output per unit of space, highly sustained, useful voltage even during heavy discharge, greater damage resistance through the use of plastic containers and covers, improved flexibility of arrangement without the use of wood trays, fewer cleaning problems, and availability as "dry" batteries when required.

The transparent containers and covers are molded from clear, heat-resistant polystyrene, a stable plastic material possessing resistance to damage from shock, thermal and mechanical stresses, and any effects from the electrolyte. The permanent seal between containers and covers eliminates leakage of the electrolyte for

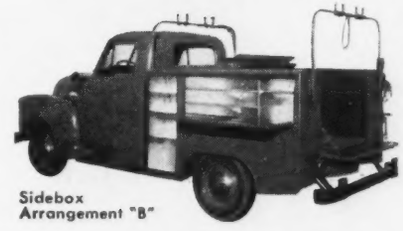
it's new... HIGHWAY GS-75
GENERAL SERVICE BODY
STURDY • FLEXIBLE • ALL-PURPOSE

At last! Here is a basic, general service body to which you can add your own selection from a wide variety of options to actually "build" a unit to meet your specific needs. At the same time you control the cost to fit your purse. With the Highway GS-75 you are not required to take a manufacturer's "pet ideas" as a permanent part of your body.

This sturdy all-steel body is equipped with heavy, double-panel doors opening on spacious side-box compartments. Two different side-box shelf arrangements are available as options. Locking-type, recessed handles on the doors control strong one key bar-locks. The doors are weather-sealed with sponge rubber, retained by metal strips. A popular option is the steel roof that slides forward, folds down and locks to the tailgate, protecting any materials stored in the big interior bed compartment.



Sidebox Arrangement "A"



Sidebox Arrangement "B"

Body is 75" length, 74" width. Mounts on most ½ ton chassis, "CA" dimensions 39" to 41".

Send today for full information on this new Highway GS-75 body and other Highway public utility equipment. Or, call or visit the friendly Highway Distributor or Factory Branch nearest you.

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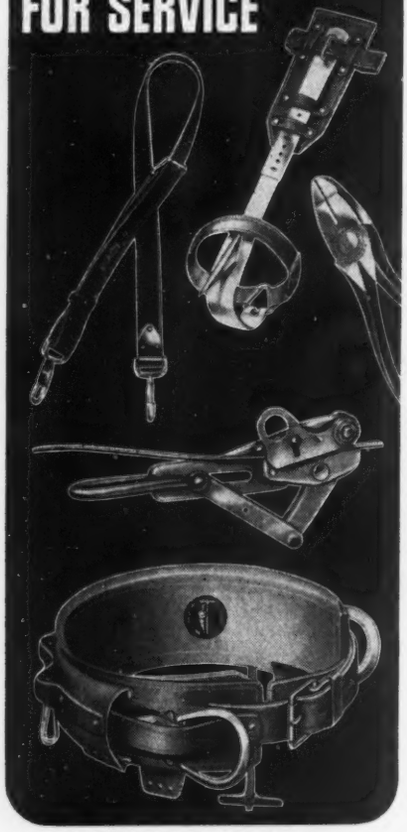

Yes, safety and service are the two big reasons why Kleins are the choice of the man on the pole. Look for the familiar Klein trade-mark on pliers and climbers, safety straps and belts, lag wrenches and grips. It has been a trade-mark of quality "Since 1857."

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the life of the battery. And reduced weight makes for lower transportation charges, easier handling, and less maintenance expense.

Heart of the power-packed CME is the world famous manchester type Plante positive plate, an exclusive Exide feature. In this plate the grid is an alloy, which, unlike pure lead, resists the "forming" action of the electric current during charge and discharge, thus retaining its strength, shape and dimensions. The alloy also resists mechanical strains and holds its original shape without growth or buckling.

The active material in the manchester positive plate is lead peroxide, which is formed by electrochemical action on the surface of the soft lead rosettes, or buttons, which are pressed into holes in the grids. The rosettes are locked in place by expansion that takes place as the soft lead is gradually transformed into active material.

In the heavy negative plates, which match the unusually long life of the manchester Plante positive plates, the lead alloy grids of interlocking rib and bar design lock the specially compounded active material firmly into place. This construction combines exceptionally low internal resistance and highly sustained capacity in balance with the manchester positive plates for exceptionally long, trouble-free service.

Detailed information on the Type CME Exide-Manchex is available in a two-color 8-page illustrated booklet punched for convenient insertion into standard 8½ x 11 three-ring binders. An accompanying data sheet and chart shows dimensions, weights, capacities and discharge characteristics. Both may be obtained by writing The Electric Storage Battery Company, Box 8109, Philadelphia 1, Pa.

F. E. Monaghan Rejoins Stromberg-Carlson Co.

FRANK E. MONAGHAN has rejoined the Stromberg-Carlson Co. in the National Sales Engineering group headed by R. O. Hoffman, chief sales engineer. This marks for Mr. Monaghan a return to the company in a new position, after a year's experience with an Independent operating company as equipment engineer.

Mr. Monaghan was born in Los Angeles, where he attended public

Frank E. Monaghan rejoins the Stromberg-Carlson Co.

high school and UCLA. Early employment was with the Lockheed Aircraft Co., where he was a supervisor in the tool inspection department, and with the Southern Pacific Railway in the operator's office.

In 1942 he entered the Signal Corps, receiving his basic training in communications at Camp Crowder, Mo., and later at Camp McCain, Miss. Overseas duty included England, the Normandy Invasion, and Linz in upper Austria. After V. E. day he was commissioned and remained in Germany to help organize the Carrier Company for the Constabulary in occupied Germany.

Upon his return to this country in 1946, Mr. Monaghan attended the training school of the New England Telephone & Telegraph Co. In 1947 he joined the installation department of Stromberg-Carlson. XY dial jobs in the Pittsburgh (Pa.) area, Florida and Minnesota were among those cut into service. During 1951 his experience included both dial and manual operation and maintenance in a progressive, medium-sized Independent telephone company.

Kellogg Moves Sales Office To New Location

THE KELLOGG Switchboard & Supply Company, Chicago, manufacturer of communication equipment, announces the transferring of its general sales offices from the main office and factory to 79 West Monroe St., Chicago, Ill. The general sales department is under the direction of F. M. Parsons, vice president and sales manager.

STROMBERG | CARLSON

transmitter

Published by the makers of famous XY Equipment

VOL. 1, No. 8, NOVEMBER, 1952

The Switch Train Of The XY Dial Telephone System

By Roy W. Jones, Chief of Circuit Design

The introduction of a new telephone system provides an opportunity to review the state of the art and to re-evaluate the current design techniques and switching practices.

In preparation for and as part of the design of the XY dial system, much thought and study was devoted to step-by-step telephone systems then in general use in this country. It was decided, after carefully weighing the factors involved in such a decision, that the XY System would provide facilities to handle local, toll, and intertoll traffic over one switch train. This is a departure from the switching practice in contemporary step-by-step systems where a separate toll switch train is generally provided to handle the toll and intertoll traffic. Some of the factors involved in reaching the decision to use a single switch train and the advantages obtained are of utmost importance in handling today's traffic problems.

Improvements in Substations

In the past, the generally accepted practice has been to provide increased transmitter current for the substation equipment on toll calls in order to raise the transmission level. This was accomplished by reducing the coil resistance of the battery-feed coils in the transmission bridge of the toll train.

The present trend to smaller-gauge cable for local telephone lines in order to effect economies in outside plant has brought about increases in the average loop resistance of subscriber lines. In order to permit the increased transmission loss resulting from higher loop resistance, improvements in substation equipment have been required. Today, the telephone instruments used by the telephone operating companies provide effective transmission characteristics much better than the instruments previously available.

As the loop resistance of telephone lines has increased, the effective increase in transmitter current from the use of toll-battery feed has decreased because the resistance of the battery-feed bridge is a smaller part of the total resistance in the telephone circuit. The toll-battery feed is most effective in increasing transmitter output on lines of low resistance where the additional output is not required.

When toll-battery feed is used, the line resistance is a larger part of the total resistance in the transmitter circuit than when local-battery feed is used and the line-loop resistance will have somewhat more effect on the transmitter output. Thus, more variations in transmission level on different lines will result.

Hazards to be Avoided

The toll-battery feed generally used in the separate toll trains requires transmission bridges of the repeat-coil type in order to minimize bridging losses. The repeat-coil requirement naturally adds to the cost of the equipment. The toll-battery feed introduces an operating hazard in that the low-resistance windings are not self-protecting. A short circuit on a line or a ground on the negative side of a line will cause current flow which will overheat the coils. In some circuits, ballast lamps are used to reduce this hazard but this requires addi-

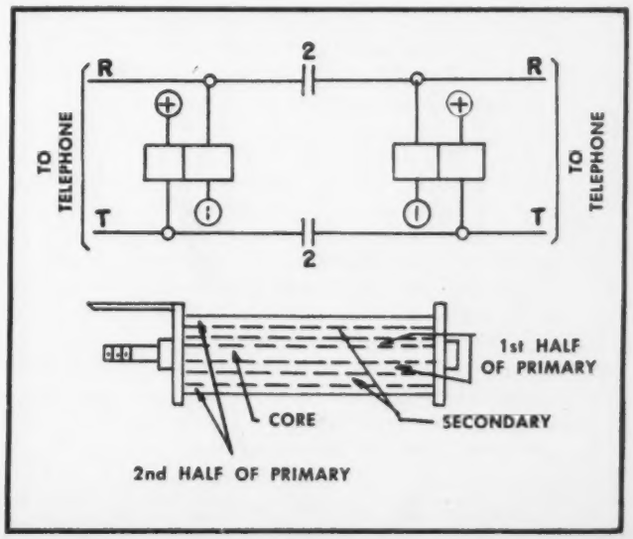


Diagram of the Stromberg-Carlson Transmission Bridge

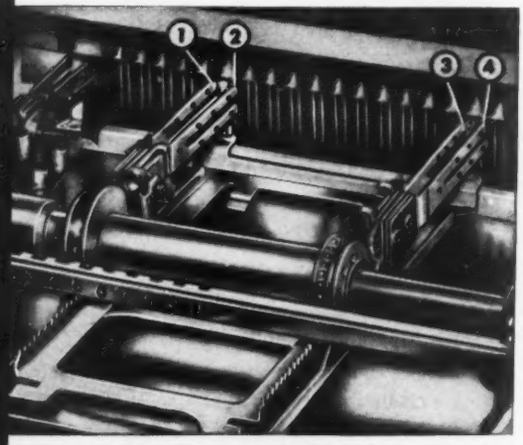
STROMBERG-CARLSON transmitter

tional apparatus and means additional cost.

In view of the above considerations, it was decided that a dial system with one switch train could be provided with satisfactory transmission characteristics and that a separate switch train for toll and intertoll calls is no longer necessary or desirable. Working installations have confirmed this belief.

A New Idea in Switch Trains

The transmission bridge of the XY System provides 200- by 200-ohm, battery-feed coils, capacitively coupled (see drawing). These coils provide a high degree of balance between windings by means of a sandwich-type winding construction. Minimum bridging losses are attained by the use of nickel-iron sleeves over the cores of these coils. This arrangement provides a very satisfactory toll-transmission bridge and by its use throughout the system automatically provides high-grade transmission on local calls for superior service.



4-wire XY Switch construction. Wires 1, 2 and 3 are Tip, Ring and Sleeve. Wire 4 (Hunt Sleeve) is exclusive Stromberg-Carlson Fourth Wire.

The switching economies of combining traffic in switch groups is so well known that it is perfectly obvious that the separation of toll, intertoll, and local terminating traffic by the use of a separate toll train is uneconomical in the usage of switching equipment. The use of the separate toll train not only requires additional groups of switches throughout the ranks of selector equipment but also requires additional quantities of switches because of the reduction in trunking efficiency brought about by the division of traffic. Additional connector equipment may also be required depending upon the trunking arrangements provided.

The trunking in an XY System is such that the terminating traffic from local 1st selectors, and operators 1st selectors is combined and handled through one switch train to the terminal of the called station.

Advantages of the Fourth Wire

The basic switching unit of the XY System is the XY Switch. This unit with its associated bare wire bank (see photo) is inherently a 4-wire switch and provides a switching system with four conductors between ranks of switches. Since only three conductors are required for the basic dial switching functions, the fourth conductor provides a facility for many additional control functions. This is the Fourth Wire which provided the facility for including in one switch train all of the features required for local, toll and intertoll switching. This Fourth Wire provided a means for giving standard toll and intertoll flashing signals independent of the transmission conductors. It has also been used to provide toll control of coin collection and refund, and other toll features. These features are provided by straight-forward, non-critical circuit operations.

All XY Systems now being manufactured for use in public exchanges provide the basic features required for intertoll switching so that the future addition of connections to the nation-wide intertoll system will require no changes in the switching equipment. One of the convenient features of an XY System is that the inclusion of intertoll operation does not require the addition of auxiliary ringing-control circuits, etc.

The XY System for public exchanges with one switch train provides all the necessary features for handling local, toll and intertoll traffic. The features required for intertoll operation are designed into the system so that the future addition of intertoll will require no changes in the switching equipment. The use of one switch train for all classes of traffic provides for economy in the quantity of switching equipment because of the traffic efficiency attained by combining traffic.

Two-Step Hookswitch Operation for 1400 Series Telephone

•

by Louis W. Droel, Apparatus Engineering

Two-step hookswitch operation has been furnished by Stromberg-Carlson Company since the 1917 model of the 896 Compact Wall Telephone.

In general, this operation has been accomplished mechanically. When a subscriber lifted the handset (receiver on the older models) the hookswitch operated partially and merely closed the circuit to the receiver. The subscriber could then monitor the line and, if it was not busy, he would press a button or lever, allowing the hookswitch to complete its operation. This connected the transmitter and thus prepared the telephone for normal use.

Such devices were first called "battery savers" and were used on rural party lines to prevent battery drain. A subscriber could check on his line to determine if it was busy without connecting his power consuming transmitter across the battery. This scheme also eliminated unintentional, but disturbing, third party interruptions.

Two-step hookswitch operation, as now used, also prevents distortion of dial pulses on party lines which would occur if a second party on the line lifted his handset while the first party was dialing. Telephones with this type of hookswitch prevent distortion of ringing codes because of wrong party answering. They also allow a subscriber to "listen-in" on his line after placing a revertive call to ascertain when ringing has stopped and the called party answers.

Two-step hookswitch operation is now available on the 1400 Series Telephone. This operation is accomplished by a spring-loaded lever which stops the hookswitch lever after it has moved far enough to close one set of contact springs, connecting the receiver to the line. The subscriber, by depressing a small button protruding through the housing near the hookswitch plunger, can then allow the hookswitch to complete its operation

and prepare the telephone for normal use. Replacing the handset on the telephone restores the hookswitch completely and resets the lever of the two-step mechanism.

The additional mechanism of the new two-step hookswitch, consisting of a bracket, lever, plunger, restoring spring, and two rivets, is completely assembled as a unit and fastens to the main hookswitch bracket of any standard 1400 Series Telephone by a single screw and nut. A housing with an additional hole to accommodate the operating plunger of the two-step mechanism is used. Like all other operating parts of the 1400 Series Telephone, the two-step hookswitch is independent of the housing and may be completely mounted and adjusted with the housing removed.

The "Farmer's Friend," as the two-step hookswitch is known at Stromberg-Carlson, has really gone "City Slicker." It is now available on the industry's most modern telephone, being used increasingly to provide finer party-line service in both rural and metropolitan areas by many independent operating companies.

Above: Two-step hook-switch is installed in a Stromberg-Carlson 1400 Series Telephone. Inset shows push-button detail, available as a package.

Help Wanted

Don Gouldin, independent operator at Kernville, Calif., is seeking young, ambitious mermaid with good speaking voice to operate his switchboard. No experience necessary. Government dam project has taken over. Every other business in Kernville already relocated. Water's rising fast; Mr. Gouldin sleeps in his rowboat.

R. O. Hoffman

MEET
R. O. Hoffman
and
Colby Knapp

C. H. Knapp

Raymond Hoffman, born and educated in Rochester, worked his way up to the position of Chief Sales Engineer at Stromberg-Carlson. Around Stromberg-Carlson he is known to all as "Obie". The nickname springs from guesses about his middle initial. The name has never been found out, but since 40 years ago after a guess of Obediah, everyone has called him "Obie".

Obie started at Stromberg-Carlson in 1910 as a clerk in the Switchboard Department. While working on Switchboard Assembly, he took special night courses at the Rochester Institute of Technology. After a two-year period as a Western Electric Company installer, he returned to Stromberg-Carlson and soon advanced to the position of foreman in the Switchboard Department. In 1922 he entered the Engineering Department to work on the design of manual switchboards.

In 1940, after working with "Mike" Levis for 6 years on the development of relay dial systems, Obie went into the Sales Department as Sales Engineer for Relay Dial Offices.

The year 1945 brought new ideas to the telephone industry and a new position to Obie Hoffman. As Chief Sales Engineer, he was part of the team which studied, developed, and perfected the XY Switch. One can see, therefore, that Obie has not only seen the telephone industry grow; he has contributed to that growth.

Obie's main interest outside of work is his family. He has four daughters and three sons. Two of the sons are already established in telephone work; one, R. E. Hoffman is Sales Engineer in our Chicago office, and the other does telephone work at a Navy-Marine base in the Southwest. Obie also has a "baker's dozen" of grandchildren. Perhaps some of them will follow in his footsteps, for he has certainly set an outstanding example for them.

Colby Knapp has been a popular figure in the telephone industry for many years. As National Supply Sales Manager he is in close contact with operating companies all over the United States, expediting delivery on those hard-to-obtain construction items and advising about the merits of new products as they appear.

Colby is very proud of his honor pin—recently acquired—which signifies his membership in the Stromberg-Carlson Quarter Century Club. His entire business career, after matriculating at Lincoln (Illinois) High School and the University of Illinois, has been spent with the company. In turn he has been Assistant Chicago Supply Manager, Chicago Supply Manager, Radio and Television representative for the Illinois territory, and the Indiana and Wisconsin territories. During the war he served as a member of the Priorities Department at the Main Office in Rochester.

After the war, operating companies faced unparalleled demands for additional service as well as the necessary rebuilding of outside plants which had been curtailed for several years. Colby was given the big job of locating suppliers and re-establishing a distribution system. In both volume of business and area served, there has been consistent growth.

Home for the Knapps — Kaye (Roche) and Colby Spencer, age five —is in Libertyville, Illinois. All of them enjoy all types of sports, especially when they can be done together as a family.

STROMBERG-CARLSON transmitter

NATIONAL SALES ENGINEERING

Standing midway between the field representatives and the engineering department is the National Sales Engineering Department. "Not *on* the firing line," says "Obie" Hoffman, the tireless but ever genial head man, "just halfway between the target and the guns."

Prior to the war a small group divided its time between the field, the home office and Pullman berths. After the war, with the tremendous spurt in dial business, much of the field work was transferred to the branch offices, and resident sales engineers were assigned to each territory. The National group was organized at this time —1945—to coordinate the work of all branches.

R. O. Hoffman, Chief Sales Engineer, and Mary Austin, secretary.

It keeps the field men posted on changes and new developments, establishes basic pricing units and reviews all orders against company standards; then sets a delivery date. Their work is confined to MDO's, except where CDO's are combined in tandem.

Obie Hoffman, chief of this group since the pre-war days, is written up elsewhere in this issue.

Ed Eyer started 36 years ago, and says he "saved" about as much of his $6.50 salary then as he can now. His long experience in telephone drafting and engineering led to his present position—sales engineering on manual central office and PBX equipment.

E. D. Eyer and Doris Verstraete

F. E. Monaghan, G. G. Orman, and J. S. Ottalagana

Joe Ottalagana also began in drafting, in 1936; there he wrote specifications for manual switchboards. Joe was in on the early dial development and became responsible engineer of the Systems Laboratory. He joined the National Sales Engineers in 1946, had a term as traveling field consultant for the Rochester branch, and is now again serving operating companies all over the nation.

Grant Orman's first job with Stromberg-Carlson was in Inspection Engineering, where he developed new techniques for automatically testing central office equipment. After three years in the Air Corps (1943-46) he worked on manual and dial systems, and early this year joined National Sales Engineering.

Frank Monaghan installed XY Dial systems in Pennsylvania and Florida from 1947-50, after "graduating" from the Signal Corps with special assignment to Carrier installations in Germany. He then spent a year as equipment engineer for an operating company, and has now returned to Stromberg-Carlson as a sales engineer.

Sherman Wiener came to the National group through Circuit Design and the Test Laboratory. His experience also includes Installation and two terms as Instructor of the XY Customer's School—one on the West Coast.

Robert Slayton joined Stromberg-Carlson in 1949, after four years in the Air Force. As a member of the National Sales Department, he handled commercial telephone sales accounts and also all repair orders. He moved to National Sales Engineering last month.

THE NATIONAL SALES DEPARTMENT

Several factors make the job of the National Sales Department extremely necessary, important and interesting.

Records of what was used 10, 20, 30 years ago in a certain office must be located to find the right part when complete information is lacking. It is easy to see that shipment is expedited when customers supply part numbers and codes.

When a new product—like the 1400 Telephone—is introduced, and when acceptance is so great that it takes a while to increase production in a like amount, the National Sales group must temporarily allocate to the branches on a basis which is fair to all.

If shortages of critical material prevent the completion of certain final assemblies, this group determines how far ahead to stockpile various noncritical components so as to rush shipments as soon as shortages can be overcome.

Who are the ones who carry out this job?

Donald Lee (and you may well be confused because there are two of them in the same office) came to Stromberg-Carlson in 1940 as a layout man on switchboard cabinets, but soon transferred to the Production Engineering Department as a process analyst. Three years were spent overseas in the Air Force; shortly after his return, Don was brought into the Sales Department and in 1951 became Sales Supervisor.

Earl Roesch has a 25-year record which began in the Cost Department. At the end of the war Earl worked in the Contract Termination Department preparing statements and reports, overseeing the storage of termination material, and disposing of it as requested. When the department was eventually dissolved, Earl joined the Sales Department as Order Editor of telephone sales.

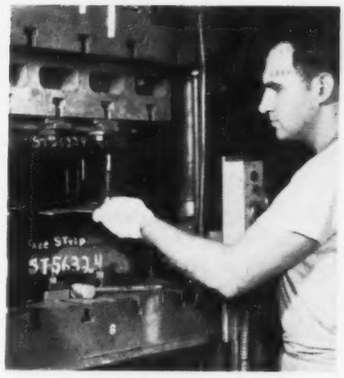
Donald E. Lee had a year of training in all telephone departments before taking over as sales representative in Pennsylvania, New Jersey and Maryland in 1938. Don was brought back to the main office in Rochester in 1947 where he has worked principally with Supply items. The editing of Supply Orders and Mail Orders is now being handled jointly by Earl Roesch and Donald E. Lee.

Left to right: ***Helen Schell, D. E. Lee, Mary Weinman, E. A. Roesch, Donald Lee, and Grace Wilkinson***

STROMBERG-CARLSON **transmitter**

FACTORY TRIP

The well-recognized properties of plastics in meeting certain requirements for insulation, toughness and in-molding of components are achieved best when all the factors, from selection of proper compound to design of tools and test fixtures, are under one roof. Complete control from powder to finished part in the Molding Department at Stromberg-Carlson is the subject of this month's factory trip.



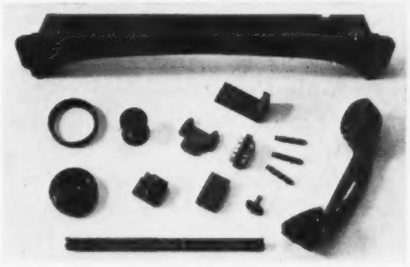
How Stromberg-Carlson Controls Manufacture of Plastic Parts

Most telephone men will be familiar with the display of molded parts shown below; the one which may have to be named is the large television tube support bracket. Earcaps, ringer spools, plungers, plugs and, of course, the familiar handset are among the more than seventy-five plastic molded parts made by Stromberg-Carlson on its own presses.

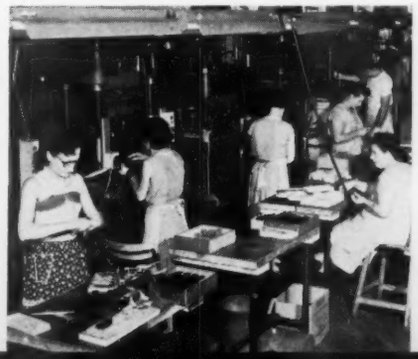
All types of phenolic molding materials are used, depending upon the end use of the part: general purpose, rubber-modified phenolic, impact (flock or rag filler), heat-resistant (asbestos filler) and electrical (mica filler). The Stokes presses are easily adaptable to fit a variety of molding requirements, permitting rapid set-up and frequent change of mold without interrupting the general flow of production.

Many of these parts require control to extremely close tolerances. Take, for instance, the wire bank separator—widely known as one of the exclusive features in the Stromberg-Carlson XY System. The ten perforations are held to less than .004" variation center-to-center; what is more, the *accumulated* variation on all ten also is kept under the same four thousandths.

The four 150-ton and five 50-ton Stokes semi-automatic compression and transfer molding presses are run on continuous shifts. Engineering and Material selection data are supplied by Edward Palmer and Richard Mullen of Materials Engineering; production is under the supervision of Maurice Ohl and Joseph Palumbo.



Parts are molded from many different materials, depending upon characteristics required for best operation.



Part of the Molding Department, showing several Stokes presses in operation.

ROCK GROVE, ILLINOIS

A different kind of Telephone Success Story

Rock Grove, Illinois, would not be selected as an example of success in the telephone field if one considered size, growth or modernization as the yardstick. There are only 210 customers on the 60 miles of line in this rural community near the Wisconsin border. Since its founding in 1906 there have been few additions—changes are principally in directory listings. The magneto instruments have come down through generations as a part of the family.

Joe Schofield, the manager, married into the telephone business seven years ago. His wife was the operator, and with Joe's training as an engineer in the Texas oil fields it looked like a good team. Both have become expert at recognizing voices—a necessity in Rock Grove, for people not only call by name instead of number, but expect the operator to remember who called during the day.

The Schofields of Rock Grove.

The exchange closes at night, except for emergencies. One of these came at midnight. A man wanted to know the time. It seems that after a private celebration he had found himself locked in the firehouse and wanted to find out how long before the chief would be back to let him out.

One evening a frantic member of the school band wanted the operator to locate a pair of marching pants; he had torn his on a barbed-wire fence, while trying a short-cut to the meeting place.

Joe and Leva make full use of any spare time. Both do leather work; Joe has a shop, of which he is justly proud, where he makes excellent brooms from local straw. When the army called up the local scoutmaster, Joe took over and loves an overnight hike with the lads.

The Rock Grove Telephone Company is mutually owned, supported by a tax instead of a toll. Many come to see the special methods in practice here, methods developed by Joe and Leva to fit the unusual conditions. For—as you may have surmised—both Joe and Leva are totally blind.

STROMBERG-CARLSON transmitter

Tarpon Springs XY Cutover Feted by Greek Dinner

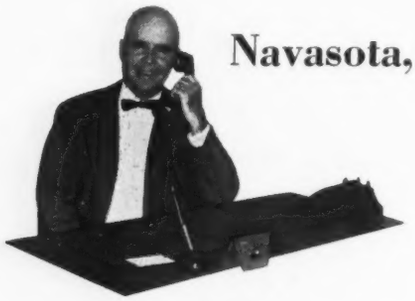
When 850 lines of Stromberg-Carlson XY Dial switching equipment were cut into service recently at Tarpon Springs, Florida, it marked another chapter in the remarkable story of the Peninsular Telephone Company. At an earlier date 6 positions of Stromberg-Carlson No. 3 Toll Board and XY Intertoll equipment were tied into the nation-wide Intertoll hook-up of the Tampa area. Subscribers in Tarpon Springs now have direct and immediate access to any major toll center in the country. Keysenders and register sender equipment have been furnished to speed operations.

A position of the XY Dial equipment in the new Tarpon Springs central office, prior to the recent cutover.

The cutover itself was a big success. One feature which took it out of the routine class was the Greek dinner party which followed. Traditional costumes, native Greek dishes, and an entertainment program which had particular appeal to the local population were part of the celebration. Tarpon Springs, with a majority of its citizens of Greek descent, is well known for its sponge fishing industry.

George Rose, general traffic superintendent, watches as two operators, Mrs. Agnes S. Tauscher and Mrs. Ida L. Campbell make the first operator-dialed toll calls from their new six-position board.

Navasota, Texas, Strides Forward



James F. Martin, President of Navasota Telephone Co.

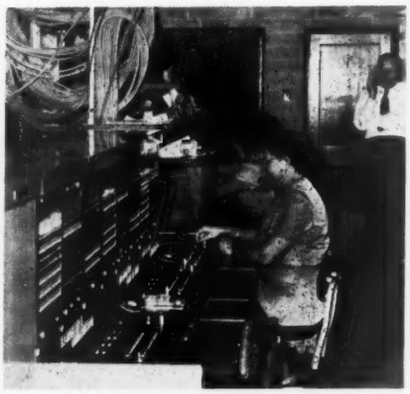
Mr. James Martin looks pleased, and so are all the residents of Navasota, Texas, as they complete business or friendly calls over their new XY Dial telephone system. In the 55 years since the first switchboard was installed, the town has become a healthy city; the telephone company has grown along with it!

Mr. Martin spent several years in Mexico in the construction field; outstanding among the jobs completed was the Tampico-to-Mexico City pipe line. In 1940 Mr. and Mrs. Martin purchased their interest in the Navasota Telephone Company. Mrs. Martin was president until her death in July of this year. During this twelve-year period the number of subscribers increased from 590 to 1560 at the time of conversion to XY dial.

Rural lines, going out in all directions from Navasota, brought in many of the new subscribers; as Anderson, Richards and Shiro are converted to dial in the near future, the total served will rise by another 50%.

Mrs. Annie Templeman, widow of founder, has followed this growth with keen interest. The present officers —Mr. Martin, President; George Franks, Vice-President and Plant Superintendent; Ben Curd, Jr., Treasurer; and Juanita Wilson, Secretary —foresee a bright future for the telephone company and the city it serves.

R. H. Barry, Mayor of Navasota, makes first call as XY system is cut into operation. An interested observer is Marion Clay, Manager at Lufkin, Texas.



First call comes in on new Toll Board as last calls are being completed on manual equipment.

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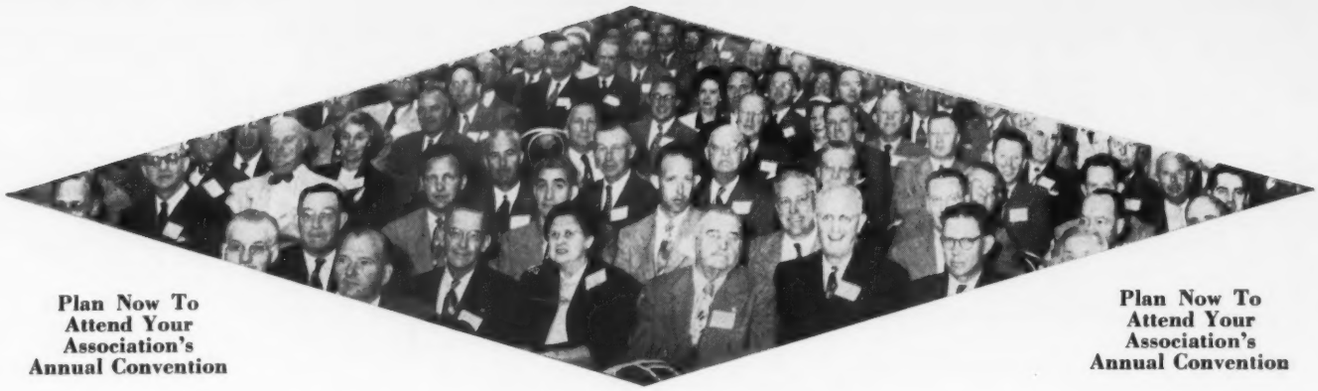

Plan Now To Attend Your Association's Annual Convention

Plan Now To Attend Your Association's Annual Convention

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By JOHN G. REYNOLDS, Managing Editor

New "Ridie Talkie" . . .

TWO RADIO AMATEURS in Linden, N. J., have come up with something new for civil defense communications.

They are Elson and Francis Kendall, 17-year-old twins, who devised a short-wave radio telephone set which can be easily mounted on the back of a bicycle.

The rig, weighing 25 pounds, is powered by dry batteries. A war surplus antenna from a tank was cut down to eight feet for the aerial. A telephone hand set is used for talking and listening. The "ridie-talkie" sends as far as four miles and is equipped to pick up not only the local sending station but the county defense network as well.

With the twins' bike radio proving itself excellently in all tests, other civil defense units in New Jersey are expected to equip bikes with similar two-way radios.

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Fame is Fleeting . . .

JOHN ZYZNESKI of New York City is feeling mighty low. For quite a spell his name has been last in the Manhattan telephone directory. But a while back someone with a nasty streak a yard wide sent him the Los Angeles phone book, called his attention to the absolute last line name in it of Ricardo Zxyzz and implied that Mr. Zyzneski isn't, after all, so much.

We can't be sure of course. But that's a trick we wouldn't have put past that Mr. Zzyzz.

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13,000,000 Enemies Of Socialism . . .

A SHORT TIME ago the Brookings Institution, with the sponsorship of the New York Stock Exchange, made the first comprehensive and authoritative survey of share ownership in the United States. A mass of important information was produced—including the fact that 6,500,000 individuals own shares in public corporations.

The *San Francisco Chronicle* ran an editorial which interpreted this fact in a novel and interesting way. It found that these individuals represent 4,750,000 families, and that each family has an average of 2.74 members. Therefore, said the *Chronicle*, more than 13,000,000 people—one out of every twelve of our citizens—have a direct and personal interest in American industry, how it is managed, how it fares, and what is happening to it.

The Brookings study disclosed, furthermore, the share owner population has increased sharply in the past three years—by some 1,500,000 people. It is only logical to assume that the ranks are still growing. From time to time surveys have been made to find out what representative Americans prefer in the way of investments, and some highly significant findings have resulted. In 1949, for instance, seven per cent of the families queried in the $2,000-and-over income level said they preferred common stocks. In 1952, the figure was 13 per cent, or practically double. The main reason given was the higher rate of return that common stocks provide.

America is thus well along the road to a system of true "public ownership" that is as different from socialism, or political ownership of our resources, as night is from day.

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Salute To President-Elect Ike

THE AMERICAN people have called upon Dwight D. Eisenhower to lead them through a period of world history that may well see an earth-shaking showdown between the free world and the forces of evil growing ever stronger behind the Iron Curtain.

Now is the time for all of us quickly to forget the hard feelings and emotional disturbances that divided us during the bitter and abusive political campaign. Now is the time to join together in prayers for our new president and for the success of his crusade for a better America in a better world.

The American people on Nov. 4 gave the free world an example of true democracy in action. They changed their leadership without bloodshed and without sacrificing our form of government. Now, as good Americans, let us all abide by the result of the election—and get behind Ike for a better country, for ourselves and our children.

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The records we have compiled from publishing telephone directories which serve more than 4,000 Independent Telephone Exchanges have enabled us to establish positive standards by which we can measure the success of a telephone directory publishing job. Among the standards we have developed are: normal directory revenue per station; normal directory revenue per business account; normal directory revenue per advertiser; and, average number of advertisers per one hundred business accounts.

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